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ADDRESS.

CLASSIFICATION AND SURGICAL TREATMENT OF ACUTE PERITONITIS.

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An intelligent and systematic discussion of the treatment of acute peritonitis must necessarily be based on a rational classification. A great deal that has been said and written on this subject, from the distant past until the present time, is worthless from a scientific as well as a practical standpoint, owing to a lack of a proper classification. The ordinary terms used to designate the different forms of peritonitis are differently interpreted and applied by pathologists as well as clinicians. Acute inflammation of the peritoneum is produced by so many different causes and assumes such varied clinical aspects, that it is extremely difficult to formulate a uniform and satisfactory classification. A discussion of the etiology, differential diagnosis, prognosis and treatment of acute peritonitis, except upon the basis of a clear and comprehensive classification, is fruitless, misleading and usually results in the deduction of erroneous and often dangerous conclusions. The classification should include the anatomy, pathology and etiology of the disease to be of value in rendering a correct diagnosis, a reliable prognosis, and in enabling the physician and surgeon to advise and apply effective therapeutic measures. It is especially important in the discussion of the surgical treatment of peritonitis, before an audience composed of physicians and surgeons, to make a clear distinction between the different clinical forms of peritonitis with a view of pointing out the limitation of purely medical treatment and the legitimate scope of surgical intervention. The clinical classification which I here suggest appears to cover the ground fairly well, but would be incomplete without an exemplification from other standpoints, and for this reason I have prepared the following:

SYLLABUS OF CLASSIFICATION OF ACUTE PERITONITIS.

Anatomic.—Ectoperitonitis, endoperitonitis, parietal peritonitis, visceral peritonitis, mesenteritis, epiploitis, perigastritis, peri enteritis, perityphlitis, peri-appendicitis, pericolitis, perihepatitis, perisplenitis, pericystitis (urinary and gall bladder), perimetritis, perisalpingitis, peri oöphoritis, pelvic peritonitis, diaphragmatic peritonitis.

Etiologic.—Traumatic peritonitis, idiopathic peritonitis, perforative peritonitis, metastatic peritonitis, puerperal peritonitis, peritonitis infantum, fetal and intra-uterine peritonitis, peritonitis neonatorum.

Pathologic.—Diffuse septic peritonitis, putrid peritonitis, hemorrhagic peritonitis, suppurative peritonitis, serous peritonitis, fibrinoplastic peritonitis.

Bacteriologic.—Streptococcus infection, staphylococcus infection, pneumococcus infection, bacillus coli communis infection, gonococcus infection, tubercular infection.

Clinical.—Ectoperitonitis, general septic peritonitis, perforative peritonitis, circumscribed peritonitis, hematogenous peritonitis, visceral peritonitis (same as anatomic), pelvic peritonitis, puerperal peritonitis, subdiaphragmatic peritonitis.

1. *Ectoperitonitis.*—An inflammation of the attached side of the peritoneum is called ectoperitonitis. As compared with inflammation of the serous surface, this inflammation of the subendothelial vascular connective tissue is characterized clinically and pathologically by intrinsic tendencies to limitations of the inflammatory process. The mechanical and anatomic conditions for diffusion of the infection are less favorable than when the free surface of the membrane is affected. Ectoperitonitis, however, in certain localities may become quite diffuse, as, for instance, when the cavum Retzii (William Gruber), or the retroperitoneal space on either side of the spinal column are the seat of a suppurative inflammation. In the latter locality a paranephric or spondylitic abscess is often the cause of an extended ectoperitonitis, the extent of the disease corresponding with the size of the subperitoneal abscess. In infected wounds of any part of the abdominal wall in which the peritoneum is exposed, but not perforated, the primary ectoperitonitis is occasionally followed by the extension of the infection to the serous surface through the lymphatics, or the direct extension of the infective process through the tissues until it reaches the endothelial lining. Peritonitis of a visceral origin is always preceded by ectoperitonitis, whether the infection reaches the peritoneal cavity through a perforation or by progressive extension of the infection from the primary focus through the tissues until it reaches the free peritoneal surface. The surgical treatment of an ectoperitonitic suppurating focus is curative and prophylactic. The prophylaxis consists in the prevention of rupture of the abscess contents into the free peritoneal cavity by an extraperitoneal incision and drainage, which ordinarily results in healing of the abscess cavity and a permanent cure. Paranephric abscesses should be treated by lumbar incision and drainage; tubercular spondylitic abscesses without fistula formation, by tapping and iodoformization; pelvic abscesses in the female, whenever practicable, by vaginal incision and drainage. If the abscess is not within reach by the vaginal route, an incision is made through the abdominal wall directly over the abscess and in the absence of adhesions the parietal peritoneum is sutured to the surface of the abscess wall and the abscess incised and drained at once, or the incision is tamponed with iodoform gauze and the abscess opened and drained a few days later after the peritoneal cavity has been more thoroughly excluded by the formation of firm adhesions.

Suppurative inflammation of the loose connective tissue in the cavum Retzii leads often to extensive ectoperitonitis, occasionally to perforation into the peritoneal cavity, septic peritonitis and death. Leusser ("Ueber das Cavum Retzii und die sogenannten prävesicalen Abscesse," *Archiv f. klin. Chirurgie*,

No. 32, 1885) has collected forty-six such cases and has made some important investigations concerning the structure and arrangement of the tissues in the prevesical space in reference to the directions in which the pus will burrow when this space is the seat of a phlegmonous inflammation. He found that the loose connective tissue between the peritoneum and the abdominal muscles is divided into two layers by a plane of fascia which is inserted into the upper border of the symphysis. An abscess in this region may therefore be submuscular or prevesical; the former occupies the space between the fascia and the muscles and assumes an ovate outline with the pointed extremity of the swelling directed downward; an abscess behind the fascia, a true prevesical abscess, resembles in outline the disturbed bladder. The prevesical abscess can be reached by rectal and vaginal examination and disturbs the function of the bladder. The indications for prompt surgical interference are particularly urgent when the abscess is deep, subperitoneal, as it is in such cases where the peritoneum is extensively involved, and the danger of extensive burrowing of the pus is greatest, and perforation into the peritoneal cavity most frequently takes place. The proper treatment of an abscess in the cavum Retzii is an early and free incision made in the same manner and with the same care as in operations for stone in the bladder by the suprapubic route.

2. *General septic peritonitis.*—The greatest confusion still prevails among pathologists, physicians and surgeons in reference to what is meant by general septic peritonitis, more particularly as to the distinction between septic and suppurative peritonitis. I understand by a general septic peritonitis an inflammation of the entire peritoneal sac with the serous covering of all abdominal organs, which, as a rule, proves fatal from progressive intoxication before sufficient time has elapsed for the formation of pus or any considerable transudate, or before any marked macroscopic tissue changes have occurred. It is the result of the most virulent infection, the patients dying not so much from the effects of the inflammation as the rapid introduction into the general circulation from the peritoneal cavity of preformed septic material. In suppurative peritonitis the primary microbic cause is less in quantity or virulence and a sufficient length of time intervenes between the beginning of the attack and the operation or death for the formation of pus and other inflammatory products. Every acute peritonitis is septic in so far that phlogistic substances reach the general circulation from the inflammatory lesion, and in that frequently the inflammation terminates in suppuration, but the term septic should be limited to those cases of diffuse septic peritonitis in which, as a rule, death occurs in a few days and before any gross pathologic conditions have had time to develop. It is a disease that is almost uniformly fatal, with or without operation, the patients dying from the effects of progressive sepsis. The claim of operators to have cured such cases by laparotomy must be accepted with a good deal of allowance. The microbes which produce this form of peritonitis are those which follow the lymphatic channels and are rapidly diffused not only over the entire peritoneal surface, parietal and visceral, but also through the subserous lymph spaces. Acute general septic peritonitis is essentially a streptococcus disease. The disease is observed most frequently after perforation into the free peritoneal cavity in the region of the small intestines of an abscess containing septic pus, rupture or perforation of any of the abdominal or pelvic viscera containing septic material, gunshot or stab wounds of the abdomen with visceral injury of the gastro-intestinal canal, and occasionally as the result of infection during a laparotomy. The gravest form of puerperal sepsis is a diffuse septic peritonitis. The subjects of this variety of peritonitis die so soon after the beginning of the disease, that at the postmortem, or if the abdomen is opened during life, at the operation, no gross tissue changes are discovered. Beside a slightly increased vascularity, nothing is found to indicate the existence of peritonitis. The septic material formed in large quantities and of intense virulence is rapidly absorbed by the stomata of the under surface of the diaphragm, discovered and described by von Recklinghausen. In putrid peritonitis the streptococcus infection is complicated by the presence of putrescible substances, which serve as a nutrient medium for saprophytic bacteria which modify the character of the inflammatory product. It occurs most frequently in connection with grave forms of puerperal nephritis. It is usually associated with more or less gangrene or ulceration of the organ or parts primarily affected, as uterus, intestine or abdominal wall. It is diffuse septic peritonitis that has so far proved so obstinate to successful surgical treatment. Surgery has done much toward its prevention, but very little toward saving life after the disease is once fully developed. Careful analysis of the cases which yielded to laparotomy would undoubtedly disclose the fact that most of them were not genuine cases of general septic peritonitis, but cases of more or less localized inflammation of the peritoneum with or without suppuration. In this opinion I am supported by no less an authority than Frederick Treves (*The Practitioner*, London, June, 1894), who, from a surgical standpoint, divides peritonitis into localized and diffuse. He states that the surgical treatment of the former has yielded encouraging results, but in general non-tubercular peritonitis it has been phenomenally unsuccessful. After speaking of circumscribed peritonitis the same author ("The Surgery of the Peritoneum," *British Medical Journal*, Oct. 3, 1896) says: "Peritonitis in the 'small intestine area' is, on the other hand, rapidly diffused and is as rapidly attended by septicemic symptoms. In the treatment of localized peritonitis surgery can claim to have made great advances, but in the treatment of diffuse peritoneal inflammation with marked constitutional symptoms there is little progress to record. The abdomen may be opened, washed out and drained, and the distended bowel may be relieved of its putrescent contents by incision, but the results at the best are not brilliant, and it is evident that the treatment of this terrible complication must still incline toward that desirable prevention which is better than cure."

I have opened, drained and washed out the peritoneal cavity in many cases of diffuse septic peritonitis and, I am free to confess, without a single successful result. All of my cases died a few hours to a day or two, after the operation, of sepsis in spite of heroic stimulation and, in some cases, of frequently repeated irrigation with sterilized water, normal solution of salt, or mild antiseptic solutions such as boracic acid and acetate of aluminium. On the other hand, some surgeons report a fair percentage of recoveries after laparotomies for what they call general septic peritonitis. Krecke (*Münch. med. Woch.*, No. 33, 34, 1892)

has collected 119 cases of laparotomy in general peritonitis, the origin of which was determined in all except 18, of which 9 died and 9 recovered. In most of the cases the disease was caused by perforation. Of these 36 followed perforation of the appendix, 12 were cases of typhoid perforation, of which 5 recovered; 12 were due to perforation from gangrene and other causes implicating the intestines. Of the gangrenous variety not one recovered, and of the 8 others only 3 were cured by the operation. Of traumatic cases, 3 of punctured and 1 of gunshot wound all recovered, but of contusions only 3 out of 8 recovered. The operation saved 5 out of 13 cases of puerperal peritonitis. Lastly a group of cases of peritonitis from various other causes yielded 3 deaths and 6 recoveries. The total result is 119 cases of general peritonitis treated by laparotomy, 51 recoveries and 68 deaths.

A. J. McCosh ("The Treatment of General Septic Peritonitis," *Annals of Surgery*, June, 1897) operated (1888 to 1895 inclusive) in forty-three cases of general septic peritonitis. Of these thirty-seven died and six recovered, a mortality of about 86 per cent. A free abdominal incision was made in all, and with few exceptions irrigation was employed.

It is not easy, nor always possible, to ascertain the extent of inflammation *in vivo* by opening the peritoneal cavity, and a strong suspicion remains that at least in some of the cases which recovered the peritonitis was not general, or that the operation was performed before the entire serous surfaces were involved. Certain principles in the medical and surgical treatment of peritonitis are applicable to all forms of the disease and the best place to discuss them is in connection with the gravest variety—acute general septic peritonitis.

Medical treatment.—A more general discussion of the medical treatment of peritonitis is out of place here, but a few words in reference to what the surgeon should do and what he should not do in the way of medical treatment when he assumes charge of a case of peritonitis is pertinent to my subject. Stomach feeding must be limited to the administration of liquid food and stimulants. If, as is so frequently the case, nausea and vomiting are prominent symptoms, rectal enemata are of the greatest value. The distressing thirst can often be effectually relieved by high rectal enemata of warm water; if these are not tolerated, by hypodermatic infusion. The therapeutic indications for cathartics and opium in the treatment of peritonitis are not definitely settled. Some favor cathartics, others condemn them and rely on opium. Mr. Tait has taught us years ago the value of saline cathartics in the prevention of peritonitis and in its treatment during the incipient stage. Most practitioners have adopted his views and administer saline cathartics as soon as the first symptoms make their appearance, and certainly the results have been much better since this practice has come into more general use. It is not only clinical observation that supports Tait's teachings and practice, but his views have been substantiated by experimental investigations. The experiments of Wegner prove that bacteria injected into the peritoneal cavity readily enter the blood vessels and lymphatics and thus reach the excretory organs, notably the intestinal canal, through which they are rapidly eliminated by free catharsis.

Lawson Tait ("Diseases of the Ovaries," fourth edition) has found the most efficient treatment for septic conditions following abdominal section to be 30 or 40 grains of sulphate of magnesia, repeated every hour or every other hour until the bowels move freely. Hence, where microbes accumulate in such quantities that nature unaided can not remove them, it is rational treatment to render assistance by the administration of saline cathartics to favor the process of elimination.

I have seen many cases of threatened peritonitis after abdominal section aborted by the timely administration of saline cathartics. If the stomach is intolerant, calomel in small doses, repeated hourly, and saline enemata are indicated.

One of the great dangers in peritonitis is rapid distension and paresis of the intestines, conditions which are provoked by opium and which can be most effectually averted by early and free catharsis. The use of cathartics is absolutely contraindicated in all cases of peritonitis caused by perforation. In such cases the use of opium is legitimate and useful as it diminishes shock, extravasation of septic material and its rapid diffusion over the peritoneal surface. Peritonitis, especially the septic variety, invariably depresses the heart's action, a condition which should be met by active stimulation. Shock, general debility and, as Fritsch has shown, a weak heart increase the danger from sepsis. Strychnia, camphor and alcoholic stimulants should be employed early and at short intervals in all cases of grave peritonitis. If these remedies are not retained by the stomach they must be administered subcutaneously or per rectum. The application of ice or the cold coil over the abdomen frequently succeeds in diminishing the tympanites and should be employed to prevent over-distension and paresis of the intestines when this condition appears and the peripheral circulation warrants their use. If the heart's action is weak and the capillary circulation sluggish, hot applications are more agreeable to the patient, and a better stimulant for the feeble peripheral circulation.

Operative treatment.—There can be no difference of opinion in reference to the advisability of early operative treatment in the management of general diffuse septic peritonitis. Without operation death is certain. An early operation may succeed in arresting further extension of infection in cases in which the disease would become diffuse, and in diffuse cases may occasionally be the means of saving a life which without it would be surely lost. An early diagnosis and prompt operative interference are the conditions *sine qua non* for success. The patient should be properly prepared for the operation, not only with a view of securing absolute asepsis for the field of operation and everything that is to be brought in contact with wound, but the necessary precautions should also be carried into effect to sustain the heart's action and stimulate the capillary circulation during and immediately after the operation. This can be accomplished by administering a 1-32 grain of strychnia, if the patient is an adult, hypodermatically and two ounces of whisky or brandy by the stomach or rectum half an hour before the anesthetic is administered. I am partial to the use of sulphuric ether as an anesthetic in performing laparotomy for this indication, as it has a less injurious effect on the already enfeebled circulation than chloroform. The body must be carefully protected against loss of heat during the administration of the anesthetic and the operation by warm flannel blankets and bottles or rubber bags containing hot water.

The normal salt solution, sterile water or antiseptic solutions which are to be used for irrigation must be kept at a temperature of 110 to 120 degrees F.

Different kinds of drains and drainage material should be on hand to be used as indications may arise.

The handling of the patient must be done with the utmost care and gentleness.

History of operation for peritonitis.—Abscesses which had their origin in the peritoneal cavity have been opened for centuries, after they presented themselves as such upon any of the accessible surfaces. Laparotomy as a therapeutic resource in the treatment of peritonitis is of recent date. J. Ewing Mears, as early as 1875, operated by abdominal section in a case of circumscribed suppurative peritonitis following childbirth. He advocated at that time surgical intervention in all cases of suppurative peritonitis. Treves ("The Treatment of Acute Peritonitis by Abdominal Section," *Brit. Med. Journ.*, March 14, 1885) reported a case of acute peritonitis treated by abdominal section in 1885, which terminated in recovery, and he recommended the operation in similar cases. During the same year Péan (*Gaz. des Hôp.*, Nos. 49, 51 and 60, 1885) advocated in the treatment of septic peritonitis incision, toilette and drainage of the abdominal cavity. He favored a large median incision, removal of inflammatory product with sponges and napkins, closure of wound by suturing, except a place large enough for drainage. About the same time Oberst ("Ein Fall von Perforations Peritonitis, Laparotomie, Tod nach 9 Wochen," *Centralblatt f. Chirurgie*, No. 20, 1885) urged energetic surgical treatment in cases of acute peritonitis. In the acutest form, however, he admitted that abdominal section and drainage were powerless in averting death from sepsis. In 1886 Lawson Tait ("Discussion on Abdominal Section," introduced by Mr. Lawson Tait, *Edinburgh Medical Journal*, May, 1886) reported two cases of acute peritonitis treated by abdominal section, of which one recovered. He advised laparotomy in all cases of peritonitis if an effusion can be demonstrated and the existence of fever indicates the pyogenic nature of the inflammatory product.

In 1889 ("Traitement Chirurgicale de la Péritonite," *Presse Méd. Belge*, No. 49, 1889), successful laparotomies for septic peritonitis were reported by Demons, Bouilly, Dernuce, Brun, Labbé and Routier. It is evident that in most of these cases the operation was performed for circumscribed suppurative and not for diffuse septic peritonitis.

The treatment of peritonitis by laparotomy received a new impulse when, about nine years ago, it was found that the disease is so often produced by primary suppurative and perforative lesions of the appendix vermiformis. About the same time gynecologists began to treat suppurative lesions of the pelvis, so frequently the precursors of a similar affection of the peritoneum, upon sound surgical principles. The old dictum, *ubi pus ibi evacuo*, is now fully appreciated by surgeons and gynecologists, and is daily put in practice in the treatment of suppurative ectoperitonitis and septic and suppurative peritonitis. Future clinical experience and experimental research will make this department of surgery one of the greatest blessings to humanity.

Incision.—In the operative treatment of general septic peritonitis authorities are as yet not agreed as to the size, location and number of incisions that should be employed in opening the abdominal cavity. In circumscribed peritonitis, the rule to open and drain by the shortest and most direct route is usually followed. In perforation of any other organ except the appendix vermiformis, resulting in diffuse peritonitis, the first incision should always be made at or near the median line. The incision is made above the umbilicus if the gall bladder, stomach or duodenum is the seat of perforation, below the umbilicus in perforation of any other portion of the small intestines.

Mikulicz ("Weitere Erfahrungen über die operative Behandlung der Perforations Peritonitis," *Archiv f. klin. Chir.*, B. 39, p. 756) makes a sharp distinction in the treatment of diffuse septic and progressive fibropurulent peritonitis. In the former variety the abdominal incision should be large, the perforation closed and the abdominal cavity disinfected and drained. In the latter the adhesions should be carefully preserved and the different pus accumulations opened and evacuated separately. Some surgeons prefer to open the abdomen some distance from the linea alba.

Ramsay (London *Lancet*, Nov. 30, 1895) gives cogent reasons why in opening the abdominal cavity the incision should not be made in the median line, but through the center of either rectus muscle where the abdominal wall is thickest and strongest, and where the different layers can be sutured separately with the greatest ease, and where for these reasons ventral hernia is least likely to follow as one of the remote consequences of the operation. Prolonged drainage is always an important etiologic element in the occurrence of post-operative ventral hernia, and this complication is certainly less likely to follow if the incision is made through the muscular portion of the abdominal wall than through the thin fibrous linea alba.

In the treatment of diffuse septic peritonitis the incision should be at least large enough to insert the hand for the purpose of making a careful intra-abdominal exploration with a view of ascertaining the extent of the disease and to locate and, if possible, treat the primary lesion. Gill Wylie (*Medical Record*, Feb. 15, 1890) recommends in the surgical treatment of diffuse peritonitis an incision of this size to enable surgeons to break up all adhesions among the intestines, and to freely wash the entire cavity of the peritoneum and insert two or more drainage tubes. The question relating to the propriety of breaking up adhesions will be discussed elsewhere, as in the form of peritonitis that is under consideration now adhesions, as a rule, are absent or, if present, few and slight. As I have stated before, the incision should be large enough to enable the surgeon to find and treat the primary affection which caused the peritonitis.

Mr. Bowlby (*Brit. Med. Journ.*, Oct. 27, 1894) is of the belief that an incision below the umbilicus does not necessarily empty the peritoneal cavity. In one case, after incising and flushing out through a subumbilical incision, he found a large quantity of gas as well as fluid remaining in the peritoneal cavity above. In cases of peritonitis resulting from perforation of a gastric or duodenal ulcer he advises two incisions (one above and one below the umbilicus), to ensure complete flushing. In diffuse peritonitis incisions should be made at a number of points with a view of facilitating irrigation and of ensuring free drainage. The best points will be above the pubes and above the umbilicus, and posteriorly through the

lumbar region on each side; in the female through drainage into the vagina, by incising the Douglas *cul-de-sac*, will answer an excellent purpose. A long incision, permitting the intestines to escape from the abdominal cavity and covering them with a piece of gutta-percha or rubber tissue which is sutured to the margins of the wound, a method of treatment suggested by Hadra of Texas, is based entirely upon theoretic grounds and is too hazardous to merit a trial.

McBurney has devised an incision for operations on the appendix that reduces to a minimum the risks of a subsequent formation of a ventral hernia (*Annals of Surgery*, July, 1894). "The skin incision is oblique, about four inches in length, crossing at a right angle a line drawn from the spine of the ilium to the umbilicus, and about an inch from the spine. This incision is a little to the outer side of the normal situation of the appendix. The fibers of the external oblique and its aponeurosis are not cut, but are separated with great care in the direction in which they run. When the edges of the wound of the external oblique are separated with retractors a considerable expanse of internal oblique muscle is seen, the fibers of which cross somewhat obliquely the opening formed by the retractors. With a blunt instrument the fibers of the internal oblique and transversalis muscles can be separated without cutting more than an occasional fiber in a line parallel with their course, that is, nearly at right angles to the incision in the external aponeurosis. Blunt retractors are now introduced, and these expose the transversalis fascia, which is then divided in the same line; last of all, the peritoneum is divided." This incision is an ideal one in the removal of a diseased appendix not complicated by suppurative periappendicitis. In the latter event the incision must be large enough to enable the surgeon to see what he is doing in order to avoid injuring important neighboring organs. It will be seen from what has been said that no fixed rules can be laid down and followed in regard to the size, location and number of incisions to be made in opening the abdominal cavity for peritonitis. The surgeon must be guided by his own judgment and adopt plans and methods applicable to each individual case rather than follow, as is only too frequently done, a routine practice.

Eventration.—A number of surgeons favor eventration after incising the peritoneal cavity freely for the purpose of effecting more thorough disinfection. In septic peritonitis the serous coat of the intestines is always damaged and frequently the muscular coat in a condition of paresis. The intestines are also usually very much distended. These conditions render them very liable to be injured and even ruptured when extensive eventration is made, to say nothing of the shock which always attends such a procedure, notwithstanding that the greatest care is exercised in protecting them with warm moist compresses.

Olshausen ("Todesursache nach Laparotomie," *Virchow's Jahresbericht*, 1887) has called attention to the danger of eventration and prolonged exposure of the healthy intestines in abdominal operations. He reported several cases in which adynamic ileus and death followed laparotomy which could be traced to no other cause. Gusserow recognizes the danger from these sources and guards against them by retaining the intestines in the abdominal cavity with large flat sponges. If such baneful results follow eventration and exposure of healthy intestines it is not difficult to conceive that the danger from the same source in laparotomy for peritonitis would be increased tenfold. The feeble circulation, the increased sensitiveness of the inflamed viscera in such cases would necessarily greatly increase the shock and aggravate the already existing intestinal paresis. If eventration is practiced for the purpose of relieving the overdistended intestines a limited part of the intestine should be brought forward into the wound. When prolapsed the loop is incised or punctured, emptied of its contents, the visceral wound sutured and the loop douched with hot water, dried and returned. Extensive eventration is dangerous and must be scrupulously avoided. I have many a time seen the dangers of extensive eventration in the operative treatment of intestinal obstruction, and wherever possible I am only too anxious to reach the object for which the operation is performed without it.

Irrigation.—The subject of irrigation in the surgical treatment of peritonitis has been frequently discussed, but so far no positive final conclusions have been reached. Some surgeons invariably irrigate, others believe that irrigation does more harm than good and are content to remove the inflammatory product by means of sponges. It is generally conceded that in diffuse peritonitis it is impossible, by any known methods of irrigation, to remove all of the infectious material from the peritoneal cavity. In diffuse septic peritonitis the patients die from the effects of sepsis caused by the absorption of septic material from the peritoneal cavity, and the surgeon resorts to irrigation almost instinctively to diminish the danger from this source. The use of strong antiseptic solutions has been abolished owing to the danger from intoxication resulting from the rapid absorption of the antiseptic employed and the damage which results from the irritating germicides when applied to the endothelial cells lining the viscera and the peritoneal sac. Sterilized water, normal physiologic solution of salt, solutions of boracic acid and acetate of aluminium and Thiersch's solutions are now most frequently used in washing out the peritoneal cavity. Whatever medium is employed should be used at a temperature of 110 to 115 F., and the stream should be sufficiently large and strong to wash out the most remote corners of the peritoneal cavity in the direction of the drainage opening or openings.

Reichel's ("Deutsche Zeitschrift f. Chirurgie," B. xxx) experimental attempts to successfully treat septic peritonitis, artificially produced in animals, were almost entirely a failure. Irrigation of the peritoneal cavity with sublimate, chloroborate of soda, salicylic acid, etc., were useless; the animals quickly perished. Laparotomy performed after the introduction of fecal matter, for the purpose of cleansing the peritoneal cavity, and prior to the development of peritonitis, according to Reichel, is not only useless, but even in healthy animals, proved to be an injurious measure. Somewhat better results were obtained by gently sponging the peritoneal surfaces, after opening the abdominal cavity, with gauze sponges, and employing the Mikulicz gauze drain. In nine experimental cases in dogs, two recoveries were obtained by this method. Reichel believes successful operative treatment is applicable only in cases of circumscribed empyema-like pus accumulations.

Delbet ("Recherches expérimentales sur le Lavage du Péritoine," *Ann. de Gynæcologie*, September, 1889) speaks more favorably of the results of irrigation of the peritoneal cavity in cases of general peritonitis

from an experimental standpoint. He ascertained by experiments on animals that if the peritoneal cavity is irrigated for ten minutes with a physiologic solution of salt, toxic substances can be introduced without causing peritonitis or death from intoxication if the infection is followed by another irrigation with the same solution. He advocates the use of salt solution in operations on the abdominal cavity when contamination takes place during the operation and in the operative treatment of septic peritonitis.

Mr. Barker (*British Med. Jour.*, 1894, p. 920) has found by experience that a very convenient method of flushing the abdominal cavity is to use a can with three taps to which tubes of large caliber are attached, and thus the peritoneal cavity can be flushed from several points at once, the fluid flowing out through the original incisions. He uses fluids for flushing at 105 degrees F.

Wiggin (*Medical Record*, Aug. 11, 1894) believes that the use of peroxid of hydrogen, followed by plenty of normal salt solution, is most beneficial in disinfecting peritoneal cavity, and in preventing adhesions. He claims that many otherwise successful laparotomies are followed by such extensive and painful adhesions that the patients are left in a worse state than before operation, and the observance of this simple rule would avoid such a disagreeable result. Continuous irrigation so useful in the treatment of septic wounds in other localities has been suggested in the treatment of general peritonitis. In 1894, Oscar Allis (*Annals of Surgery*, 1894, p. 179) recommended in the treatment of general septic peritonitis abdominal section, liberation of pus from all pockets by tearing adhesions, continuous irrigation, the local application of cerate to the walls of the suppurating cavities, the prone position and to keep the wound open by tucking a rubber dam covered with cerate between the abdominal wall and the intestines on each side, with one border emerging from the incision. He believes that under a continuous system of flushing or irrigation the wash products would be made to float constantly to the surface, and be more effectually carried off than by dependent dorsal drainage. The peritoneal cavity can not be flushed continuously for any length of time, as adhesions will soon form around the drainage tubes and between the intestinal coils. In acute septic peritonitis, however, continuous drainage deserves a fair trial. The fluid to be used should be introduced into the lowest portion of the abdominal cavity through a non-fenestrated rubber tube and seek escape through the rubber tubes above the umbilicus and in the lumbar regions.

The propriety of tearing up adhesions for the purpose of making the irrigation more thorough is very questionable and as a rule should be avoided. The so-called toilette by using sponges must be done with the utmost gentleness, if resorted to at all, as all mechanical insults inflicted on the endothelial surface are sure to aggravate the existing conditions. If it is intended to remove the fluid from the peritoneal cavity it is better to do so by placing the patient on the side so as to pour it out instead of removing it by mopping. If no irrigation is employed and the peritoneal cavity contains a transudate of serum or pus the fluid should be disposed of in the same way when the more thorough cleansing can be effected by the gentle use of a soft sea-sponge.

Incision of overdistended intestine.—One of the most unfavorable conditions in peritonitis is overdistention of the intestines with gas and septic fluid material. A paretic inflamed intestine is permeable to pathogenic microbes, thus adding another fruitful source of infection to the existing septic inflammation. Death in peritonitis is the result more of rapid intoxication than the inflammation itself. The inflammation of the visceral peritoneum of the intestines leads to paralysis of the muscular coat, rapid distension and the escape of preformed toxins and bacteria. Boennecken's experiments have shown that the latter takes place in a remarkably short time. It is natural that surgeons should have made attempts to remove the distension and unload the intestines of septic material by tapping or by making one or more visceral incisions.

Mixter (*Boston Medical and Surgical Journal*, 1895, No. 9) advises this procedure in grave cases of general peritonitis. He recommends incision of the coils of the paretic intestines at as many points as may be necessary to thoroughly evacuate them. The intestine should be drawn out of the wound, held over a basin, incised in from one to four places and thoroughly emptied, after which the coils should be quickly washed off with a hot saline solution, the visceral wounds sutured, the intestine returned and the abdominal incision closed. Mixter has resorted to this procedure in nearly twenty cases, some of which recovered, and in those that died the visceral wounds were found to be tight. In some cases, particularly in those that have had an abdominal incision on the right side, the author secures permanent drainage by introducing a tube into the most prominent part of the cecum and retains it as long as necessary. Through this tube medicines and nourishment may be introduced if the stomach is not retentive. In a paper read before the Royal Medical and Surgical Society, Mr. C. B. Lockwood advocated puncture and incision of the paretic intestine in cases of diffuse septic peritonitis treated by abdominal section. Incision of the intestine for the purpose of relieving distension and evacuating septic contents was favored by Hulke, Knowsly Thornton and Barker. In the few cases in which McCosh incised the intestine he noted that it did not relieve the distension for a distance of more than ten or twelve inches. The writer has made visceral incisions in a number of cases in which the intestine had become paretic and although but one of the cases recovered he is fairly convinced that it is almost essential to success in such desperate cases. I am in the habit of placing the patient on the side and bringing the most distended part of the intestine well forward into the wound and making a transverse incision about an inch in length opposite the mesenteric attachment. As the intestinal wall does not contract evacuation should be secured by pouring out the contents from above and below the incision by grasping the intestine some distance from the incision and bringing it above the level of the visceral incision. By this method several feet of intestine can be evacuated through one incision. After thorough cleansing of the exposed intestinal surface with warm salt solution, the wound is sutured in the usual manner and the intestine returned. If more than one incision is made I can readily conceive that irrigation of the intestinal tract between them with a warm normal solution of salt would secure a more thorough cleansing of that part of the intestinal tract and would be a potent means of restoring intestinal peristalsis.

Drainage.—Drainage of the abdominal cavity after operations for peritonitis is an admission of the present imperfect state of surgery. It is an acknowledgment on the part of the surgeon that he has only in part fulfilled the indications for which the operation was performed; it is a confession that he was not able to accomplish what was so much needed and what he so earnestly desired—complete asepsis of the entire peritoneal cavity. With the means at our disposal at the present time drainage in the surgical treatment of peritonitis is an unavoidable evil. The question that confronts us now is not when but how to drain in such cases. In 1870, during the Franco-Prussian War, Marion Sims made a special study of the cause of death in cases of gunshot wounds of the abdomen. The result of his observations led him to the conclusion that, independently of shock and hemorrhage, death resulted from sepsis. He found that with few exceptions, if the bullet entered above the pelvis the case was fatal, while similar wounds of the pelvic portion of the abdominal cavity ended in recovery. He ascribed this difference in the mortality to the circumstance that high wounds resulted in extravasation of intestinal contents which accumulated in the pelvic cavity, while in pelvic wounds the track made by the bullet served as a drainage canal. In 1872 he recommended that in all penetrating wounds of the abdomen and in operations on any of its contents, drainage should be established. In ovariotomy he recommended tubular drainage through the wound and vagina, using for this purpose a large rubber drain. Very few surgeons at the present day would feel justified in opening the abdominal cavity for peritonitis and dispense with drainage. Voices have, however, been raised against too frequent resort to drainage, among them Olshausen ("Ueber Marion Sims," 1896), who says: "Drainage of the peritoneal cavity is an illusion. Drainage to be of service must be limited to the evacuation of preformed pathologic spaces."

Removal of fluid pathologic products by gentle sponging accomplishes the same object. The absorptive power of the peritoneum should be preserved as much as possible by handling with the utmost gentleness. Prolonged and rough manipulation of the intestines is productive of great shock. Drainage is always attended by the danger of putrefaction bacilli entering into the peritoneal cavity. In perforating wounds he recommends a careful cleansing, complete hemostasis, avoiding drainage in all recent cases.

Barker ("Remarks on the Limits of Drainage in Suppurative Conditions of the Abdominal Cavity," *British Med. Journal*, May 25, 1896) has largely dispensed with drainage of the abdominal cavity for suppurative lesions. He relies mainly on thorough flushing and sutures the abdominal incision. He only resorts to drainage in the treatment of putrid abscesses caused by appendicitis. If a drain is used in exceptional cases of peritonitis he advises its removal at the expiration of twenty-four hours. The difficulties encountered in draining the peritoneal cavity become very apparent in following the work of Bardenheuer ("Die Drainirung der Peritoneal Höhle," 1881). He describes four methods in operations on the abdominal and pelvic cavities of women. The first method is by a T-shaped tubular drain of which only the transverse piece is fenestrated and the vertical portion brought out behind the uterus into the vagina. The second method consisted in using two instead of one transverse drain, fastened together, of which the four ends were sutured to the pelvic floor with catgut. The third method had in view the prevention of prolapse of the intestines by using a fenestrated rubber plate above the drains, which was sutured to the pelvic peritoneum. This method proved useful for the first four to six days; after this time putrefaction of the contents of the cavity invariably set in. The subsequent removal of the plate through the vagina also proved troublesome and often deleterious. The last method consisted in the use of a catgut net with meshes 6 centimeters wide, sewed to the pelvic floor above the two rubber drains. The pelvic peritoneum was always united to the vaginal mucous membrane with suture. This method proved eminently satisfactory, but I doubt if it still remains in use in his practice; certainly it has never been generally adopted.

(To be continued.)

ORIGINAL ARTICLES.

CELANDIN, ITS PHARMACOLOGY, PHYSIOLOGIC ACTION AND THERAPY.

Presented to the Section on Materia Medica, Pharmacy and Therapeutics at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1–4, 1897.

BY JOHN V. SHOEMAKER, M.D., LL.D.
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Celandin is the whole herb of the *chelidonium majus* of the natural order *papaveraceæ* and grows both in Europe and North America. The plant contains two alkaloids, chelidonin and sanguinarin. These exist in combination with chelidonic acid. A bitter, yellow, crystallin substance, termed chelidoxanthin by Probst is also a constituent, besides tannic acid, starch, cellulose, etc.

Celandin has an acid, bitter taste. Taken internally in small doses it has an appetizing and tonic effect and stimulates the intestinal glands, liver, kidneys and bronchial mucous membrane. In large quantities it causes vomiting and purging. The fresh milky juice of the plant has a local irritant action. By virtue of this property it has long been popularly used as an application to warts and corns. Internally celandin was anciently given for the relief of catarrhal jaundice.

From its power in the removal of papillary outgrowths Dr. Denissenko, a Russian physician, conceived that the fresh juice of chelidonium majus might prove beneficial in epithelioma. This observer made trial of the remedy in a number of cases and published some highly favorable results. He employed the drug both internally and externally, giving from twenty-four to seventy-five grains daily of the extract in watery solution. At the same time he made injections at several points into the tumor near to its border of a mixture of equal parts of extract of chelidonium, distilled water and glycerin. In cases of ulceration he painted the surface with the same glycerin extract. He states that after several days of this treatment there form at the points of injection, fistulous tracts, around which the tumor disappeared. In fifteen to twenty days later, according to Denissenko, the diseased is clearly separated from the healthy tissue and the tumor is diminished by half; in some cases it is entirely gone and the enlargements of the glands have subsided. In support of his statements the author reported a series of cases in which cure or marked amelioration occurred. His results have been

subsequently both confirmed and denied by different writers.

Any remedy which is claimed to exert a favorable influence on so grave a malady as carcinoma deserves the most careful and impartial study. Accordingly, in order to repeat these experiments I procured a sample of *chelidonium majus* and had prepared from it the mixture of extract, distilled water and glycerin recommended. A number of cases of epithelioma were subjected to Denissenko's method, which was faithfully carried out in every particular. A brief account of a few of these may here be given.

A lady 63 years of age had noticed a dry, papillary growth upon the lower lip for about two months. The tumor was small in size, dry, wart-like in appearance and the seat of occasional stinging pain. There was no ulceration. At times the patient picked at the little tumor and caused the exit of a few drops of blood. Otherwise there was no discharge. The neighboring glands were not involved.

A second lady of about the same age, had been afflicted with a hard, dry, wart-like excrescence upon the left cheek a short distance external to the chin for about three months. The lesion was moderately painful and had very slowly enlarged. It was about half an inch in average diameter, its outline being rather oval. Here also was no implication of the glands.

Both the preceding cases, therefore, being typical superficial epithelioma not far advanced, attended by no glandular or systemic complication—in other words as yet local lesions—might fairly be regarded as particularly amenable to any treatment having power to influence carcinoma.

A third case exhibited epithelioma of the lip in a more advanced stage. The sufferer was a man aged 70 years, in whom the disease had existed for seven months. It had gone on to ulceration and there was the characteristic sore with its steep, hard edges, indurated base and raw, red surface with a tendency to hemorrhage. There was slight enlargement of submaxillary glands but no cachexia. This case was less favorable to any treatment but nevertheless was by no means hopeless.

In a fourth case the patient was a man in whom epithelioma had existed for ten months. He gave his age as 46 years, which is rather early for the advent of this disease. The lesion made its appearance as a dry scab on the tip of the nose. The patient scratched the scab off but it soon redeveloped and from that time the affection had continuously and progressively spread. In the beginning the sore had been dry, but at a later period it discharged a thin seropurulent matter when picked. He had not experienced much pain but at times a tingling or stabbing sensation affected the nose. Latterly he had begun to suffer from pain radiating from the nose into the temple and forehead. The surface had ulcerated.

A woman 66 years of age, was afflicted with an epithelioma of the right cheek. The disease had begun a year previously as a hard crust which gave no pain. In the course of a few weeks the crust had fallen, leaving a dry, scaly base. There was no redness of the surrounding skin. The spot of disease began to enlarge and the surrounding skin became red. The lesion was very hard to the touch. For two months the surface had been ulcerated and was the seat of extreme lancinating pain.

I made use of celandin in other cases of epithelioma in different stages and different situations, but it is unnecessary to cite the histories of case after case. I followed precisely the directions given above as to injections, painting the surface and internal use of the drug. I regret very much to be obliged to say that I could observe no appreciable effect on the growths. The remedy seemed to exert in some cases a certain tonic influence but beyond that action was of no value. I am consequently unable to corroborate the results of Dr. Denissenko.

An experience similar to my own has been reported by a number of Russian physicians. In some cases these observers saw collapse follow administration of the remedy. Kalabine made the same observation as myself, viz., some amelioration of the general condition and increase of strength but no local effect. Botkine has recorded an unsatisfactory experience. Nevertheless, it is proper that clinical investigation should be continued. Dr. Samson journeyed from England for the express purpose of visiting Dr. Denissenko, studying his methods and observing his results and was led to the belief, from what he saw, that the treatment has a basis of merit. Dr. Robinson of Constantinople, has published the history of a case in which the use of celandin was followed by marked improvement.

There is no doubt that the local application of the juice of *chelidonium majus* will destroy certain non-malignant hypertrophic lesions as warts, corns and callosities. It may also be serviceable in chronic eczema; in fact in all hypertrophic conditions of the integument due to perverted nutrition or chronic inflammation. I am of the opinion, however, that it will be found destitute of influence upon the development of heterologous, malignant neoplasms.

CARVACROL IODID.

Presented to the Section on Materia Medica, Pharmacy and Therapeutics, at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1–4, 1897.

BY ARTHUR H. COHN, PH.G., M.D.

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This substitute for iodoform is offered to the profession because of the unpleasant odor, often irritating character and, last but not least, of the non-antiseptic properties of the latter. It is a well known fact that iodoform is not an antiseptic, so we must look forward to a preparation which will fulfil our wants. Bacteriologists have proven that cultures of pathologic and non-pathologic bacteria may be propagated on it. Shirmunski demonstrated the non-antiseptic properties of iodoform as follows: He added to a gelatin solution iodoform and sterilized water; this mixture again was poured into shallow dishes, allowed to evaporate, on which iodin was liberated, but nevertheless bacteria grew on this culture medium. He also experimented by mixing staphylococci and streptococci with iodoform, but after making culture from the mixture found that not only were the pus germs propagating, but also that bacteria which were originally found in the iodoform were multiplying. Only freshly prepared iodoform was found to be free from bacteria in some cases.

Dry heat or steam, or washing with ether, can not be applied in sterilization of iodoform, on account of the two former decomposing it and the latter leaving scales upon evaporation. Corrosive sublimate can not be used because the red iodid of mercury results. Washing with solution of carbolic acid was also recommended, but was found to be uncertain. It will

easily be seen how difficult it is to obtain a sterile preparation of iodoform, and it is no wonder we are looking forward to a preparation which will take its place.

The preparation which I should recommend to the profession for consideration is iodocrol or carvacrol iodid. Carvacrol is an isomer of thymol, differing only in relative position of the hydroxyl groups in the nucleus. It is manufactured in the following manner: Two grams of carvacrol and thirty-eight grams of potassium iodid are dissolved in 40 c.c. of a 10 per cent. aqueous solution of sodium hydrate. To this a solution of chlorinated soda is gradually added under continuous stirring until no more of a precipitate is found. During the reaction the mixture is kept cool by placing the vessel in cold water. The precipitate is collected on a filter and first washed with water to which a very small quantity of alkali has been added, and then with pure water. It is then allowed to dry at the temperature of the room. The product is a bulky, grayish yellow or buff-colored amorphous powder having a faint aromatic odor. It is soluble in ether, chloroform, benzin, carbon disulphid, volatile and fixed oils. From its solution in ether and chloroform it is precipitated on the addition of alcohol, becoming paler in color. This purified product did not show signs of shrinkage until above 170 degrees C., and at 200 degrees C. had become tarry and black, but not liquefied. It combines the antiseptic properties of carvacrol with those of iodin and possesses the advantage over iodoform in being odorless or nearly so, and in being five times as bulky.

Experiments have been made to grow staphylococci and streptococci on carvacrol iodid, but with negative results, thus proving it to be a true antiseptic. It may be used as a dusting powder, either pure or diluted with boracic acid. In the treatment of the nose and throat it is best used in a solution of almond oil or olive oil. It has been used as a dressing for wounds to a great extent in Milwaukee in the National Home of Volunteer Soldiers. It is also manufactured into gauze. It may be used with great benefit in almost all surgical dressings; eczema, pruritus, chancres, chancroids, etc.

In conclusion, I would say that this preparation has so many advantages over iodoform, especially so of being a true antiseptic, that I sincerely recommend it to the profession and hope it will be given a fair trial.

A NOTE ON TWO NEW CREOSOTE COMPOUNDS: CREOSOTE VALERIANATE AND GUAIACOL VALERIANATE.

Presented to the Section on Materia Medica, Pharmacy and Therapeutics, at the Forty-eighth Annual Meeting of the American Medical Association at Philadelphia, Pa., June 1-4, 1897.

BY FRANK WOODBURY, M.D.
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In these days of new remedies of ephemeral usefulness and evanescent reputation, it is refreshing to take up, for brief consideration, a drug with an established record of more than half a century. We recall the fact that while experimenting with tar from beech-wood, Reichenbach, in 1832, first obtained a fluid substance, which, on account of its possessing pre-eminently the power of preventing putrefaction in organic substances, he termed "creosote," or "flesh preserver." That expert chemist also fully recognized the fact that the new chemic agent was not a simple, but a very complex, substance, being composed principally of hydrocarbons of the aromatic group. It also contains a variable quantity of water. According to a recent authority, Marasse, it contains phenol, cresol, phlorol, guaiacol and creosol; also methylcreosol and the methylic ethers of guaiacol, phlorol, etc. By fractional distillation, Hofmann separated the dimethylic ethers of pyrogallol, of methyl-pyrogallol and of propyl-pyrogallol from that portion of the creosote which passes over at a temperature above 220 degrees. Hofmann discovered a new body, which he named coerulignol, possessing powerful toxic properties and which should be carefully removed from creosote that is designed to be used for medicinal purposes. Its presence may be detected by treating an alcoholic solution of creosote by a test solution of barium hydrate. If coerulignol is present the solution will turn blue or show a bluish tinge. Benzin may be substituted for alcohol with the same result. The United States Pharmacopeia has adopted this as one of the tests indicating the suitableness of a specimen of creosote for medicinal use.

I have referred to the early studies of creosote by its discoverer, Reichenbach, in order to bring into marked prominence the fact that it was first obtained from tar from the beech wood, and the early experiments made upon this agent, not only chemically but also physiologically and clinically, were made with the form of creosote which is still considered the best for medical use and which is now used almost exclusively in therapeutics. An analogous substance obtained from coal-tar is simply a mixture of phenol and cresylol of variable composition, or in other words an impure carbolic acid. These differ, chemically, principally in the following characters: Creosote from wood-tar added to an equal quantity of glycerin is precipitated upon the addition of water; added to collodion it does not coagulate it; and when treated with nitric acid and heat, by Clarke's method, yields oxalic acid. The so-called creosote from coal-tar is not precipitated by water from its gelatin solution; it does coagulate collodion, and yields picric acid when treated with nitric acid. There are corresponding and equally well marked differences between the two compounds in their physiologic action, the most important being the comparative innocuousness of pure wood-tar creosote, which can be taken in large doses, not only without toxic symptoms, but with decided therapeutic results, 500 drops daily having been taken without ill effect.

It has unfortunately occurred that, for many years, the coal-tar extractive was frequently dispensed for creosote, and the latter consequently fell into disrepute for a time on account of the accidents and untoward results from its use. Creosote, according ro Dr. H. C. Wood, is also liable to be adulterated with eupion. In the latest edition of the "United States Dispensatory," by Professors Wood, Remington and Sadtler, the statement is made that "Commercial creosote almost always contains carbolic and cresylic acids from coal-tar, and indeed, much of what is sold for creosote is nothing more than impure carbolic acid." I can not, however, agree with these distinguished authorities in the statement contained in the sentence immediately following the above, which says, referring to carbolic acid, that "this acid strongly resembles creosote, and this resemblance probably extends also to their therapeutic effects, so that the

substitution is less to be regretted than might otherwise be the case." This I regard as a most misleading and dangerous teaching. A patient may take as much as 600 drops of creosote, as in Dr. Freudenthal's case (*Medical Record*, 1892), and recover practically without the use of any remedies; but would this case have resulted so favorably had the same quantity of carbolic acid been swallowed instead of creosote?

The principal constituent of creosote is guaiacol, the methyl ether of pyrocatechin, which is present in the proportion of 60 to 80 per cent. in the best specimens. Guaiacol in a pure state is crystalline, but as commonly met with is an oily-looking fluid with a peculiar pungent, smoky odor. It can be obtained, however, in an absolutely pure condition from a commercial sample, by cooling with a mixture of ice and salt and then separating the crystals which have formed, as stated by S. Winghoffer (*Pharmaceutische Zeitung*, Berlin, 1894).

On account of the liability to adulteration in commercial guaiacol and its variable composition, various compounds have been introduced into the practice of medicine as substitutes for creosote and guaiacol. Among the more prominent of these are the carbonate of guaiacol, guaiacol salol, benzyl-guaiacol or benzosol, cinnamyl-guaiacol or styracol, guaiacol phosphite, guaiacol biniodid, and most recently the guaiacol valerianate. These various compounds are administered with the view of their undergoing decomposition in the intestinal tract and yielding guaiacol at the point where it can be most readily absorbed into the blood vessels. In this way the administration of chemically pure guaiacol is accomplished more surely than by any other method. Moreover, these compounds, generally speaking, are more agreeable to the palate than the guaiacol itself.

Physiologic action.—Locally, guaiacol acts, like solutions of carbolic acid, to produce limited surface anesthesia. Dr. Newcomb of New York, at the recent meeting of the American Laryngologic Association, recommended a 5 per cent. solution in olive oil as a substitute for cocain for nasal operations. I have used the guaiacol valerianate for this purpose both in full strength and diluted, and found it to produce, after slight sensation of heat, decided anesthetic effects which are slower in appearing than after the application of cocain, and which are not followed by secondary hyperemia. The antiseptic power of guaiacol is also of great value in throat and nose operations. We know of the frequency of the presence of virulent bacilli in the nasal chambers of apparently healthy individuals, and the routine use of detergent remedies followed by a decided antiseptic, such as guaiacol in oily solution, or the more agreeable valerianate of guaiacol, is now almost necessary in the conduct of our hospital and private work. I should have stated that the valerianate has a strong odor of valerian which almost masks the guaiacol, and produces a combination suggestive of walnuts. Guaiacol valerianate is a local anesthetic to the skin when applied in full strength. The temperature-reducing power of guaiacol, discovered by Sciolla[1] in 1894, is one of the most remarkable observations in the whole realm of pharmacology. This is not likely to occur in persons of good health with a normal temperature, but it is very marked in conditions of pyrexia. Caporali[2] has found that the external applications of guaiacol not only relieve pain and reduce abnormal temperature, but also increase the utilization of albuminoids by the organism and the absorption of fat, and diminish oxidation.

Administered internally, guaiacol and creosote both exert a powerful antiseptic action on the contents of the alimentary canal. The temperature reduction appears to be due to a special action of guaiacol upon the peripheral end-organs of the nerves in the skin and mucuous membranes. Upon the heart and blood vessels there are no obvious effects from moderate doses of creosote or guaiacol. In larger doses it acts as a cardiac depressant, producing diaphoresis from relaxation of the blood vessels, also giddiness and a tendency to fainting or collapse, convulsions or coma, but these disagreeable effects are more likely to occur from commercial creosote or guaiacol than from a chemically pure article. In escaping from the blood by the bronchial mucous membrane and urinary organs, guaiacol exerts a local stimulant and antiseptic action.

From the very brief review of the physiologic action of guaiacol, I turn to the therapeutic use, confining my remarks to the guaiacol valerianate and creosote valerianate, which were recently introduced by Dr. Gustav Wendt of Berlin, and which I have used, to some extent, for the past three months in private and dispensary practice. I will simply summarize some of the results of the use of these agents. Both of them are liquid and have a characteristic odor, the guaiacol valerianate being more agreeable to patients than the creosote compound.

In painful affections of the skin, attended by hyperemia such as inflamed acne, or abscess in the external auditory canal, pin-boils, etc., applications of pure guaiacol valerianate relieved pain, and checked further pus formation. In chilblains this agent promptly relieved the annoying symptoms. Small compresses wet with guaiacol and applied over the painful spots of Valleix, afforded almost immediate relief in neuralgia.

In an acute erythema of the face, apparently erysipelatous, but possibly the result of rhus-poisoning, a single application of this agent for ten minutes, followed by applications of zinc ointment containing creosote (one drachm to the ounce), afforded immediate relief and prompt disappearance of the inflammation. In the cases of children, however, or where larger areas are involved, the antithermic effect should be borne in mind, and not more than 25 to 30 drops applied at one time.

I have already alluded to the use of guaiacol valerianate in the treatment of affections of the nose. In acute rhinitis it should be diluted with three or more parts of oil of sweet almonds, or liquid albolene, and in this form it acts as a protective as well as an analgesic and antiseptic application. In chronic rhinitis, especially the purulent form, as well as in some varieties of atrophic rhinitis, it is used in full strength with advantage, as many of these cases are kept up by the presence of virulent micro-organisms, the action of which is inhibited by the guaiacol. In ulcerated conditions, even of supposed tubercular origin, a few applications of pure guaiacol or creosote valerianate materially promotes the healing process, at the same time relieving pain. This observation also applies to the larynx. I have not yet employed it in lupus, but it might be of service here for its local anesthetic effects, prior to scraping and the application of lactic

[1] Cronica di Clin. Med. di Geneva for 1892, Vol. p. 171.
[2] Riforma Medica, Naples, No. 175, 1894.

acid and the subsequent use of a 20 per cent. guaiacol spray as recommended by Dr. P. Watson Williams.[3] In tuberculosis of the air-passages, external applications of pure guaiacol have been recommended by Prof. J. Solis-Cohen, and for this purpose the valerianate would have an especial advantage. Internally guaiacol valerianate is given either in milk, in dilute alcohol, or better, in the form of capsules. It checks bronchorrhea and reduces the number of tubercle bacilli in the sputum, at the same time that it tends to prevent re-infection from the intestinal tract. It is well borne in moderate doses, 10 to 30 minims daily, or one to three capsules, each containing 2 grains, or $3\frac{1}{3}$ minims, three times a day.

In the treatment of gastric catarrh, chronic gastritis with gastrectasia, and other conditions associated with, or producing fermentation of the contents of the stomach, I have used creosote valerianate in preference to the guaiacol as I believe it to exert stronger antiseptic action. It also overcomes nausea and in connection with lavage, favors the return to healthy condition of the mucous membrane and the re-establishment of appetite and normal digestion.

Fifty years ago, Dr. Fahnestock [4] used pure creosote as an application to erysipelas, with remarkable success. I have already referred to the use of guaiacol valerianate as a local application for erythema and would suggest its use as a topical agent in erysipelas, and also in smallpox.

In cases of pulmonary phthisis the remedy has been well borne, but I have had it under observation too brief a time to report decided results. Very favorable results, however, have been observed by Dr. Rieck of Bassum, Germany,[5] who reports increase of appetite and powers of digestion, and of physical strength under its use. In cases of the initial stage of tuberculosis of the lungs, this improvement was quite marked, with a decided diminution of the cough; the expectoration not only became more free, but it also decreased steadily in quantity. The night sweats disappeared. His report was based on the study of twenty-three cases (sixteen of catarrh of the apices and seven of developed tuberculosis), which were markedly benefited.

I have found the guaiacol valerianate of decided value in the treatment of the so-called catarrhal state which is sometimes considered as the pre-tubercular stage of phthisis pulmonalis. It seems especially suited, when properly diluted with some bland oil, for intra-tracheal injection in cases of advanced phthisis, with or without ulceration in the larynx, or cavity in the lung. Inhalations of creosote in combination with oil of pepermint is claimed by Dr. Carasso, to cause a disappearance of the tubercle bacilli from the sputum, and he reports good results clinically after nearly ten years experience with it. Certainly, the form of aerial medication is worthy of extended trial, and guaiacol valerianate would be preferable to creosote for this purpose. I am of the opinion that we have in guaiacol the best remedy known at present to counteract the pernicious activity of the tubercle bacillus, and I may repeat the words of Dr. Jacobi: "No one treatment of all forms of tuberculosis ever satisfied me to the same degree as has that of guaiacol." When introduced into the stomach, the guaiacol valerianate is decomposed and the effects of pure guaiacol, with the sedative action of valerianic acid, are simultaneously obtained, which may be expected to have a favorable effect on the nervous manifestations of the disease, reducing cough and restlessness. In pneumonia, Malderasco used applications of guaiacol to the thorax posteriorly, over the affected area of the lung, with reduction of temperature and a diminished mortality.

For further and more detailed information, I may refer those interested to reports from the medical clinic of the Royal Charity Hospital of Berlin, by Dr. Grawitz, and Dr. Rieck already referred to, which have appeared in the *Deutsche Medizinal. Zeitung* and the *Therapeutische Monatsheft* for 1896.

DISCUSSION.

A visitor stated that he had examined several specimens of creosote last year and had not found them to contain any guaiacol whatever.

Dr. WOODBURY said that this confirms the statement in the Dispensatory that commercial creosote is often merely impure carbolic acid.

[3] Medical Annual, London, 1897.
[4] American Journal of the Medical Sciences, 1848.
[5] Deutsche Medizinal. Zeitung, Berlin, Dec. 24, 1896.

MEDICAL BOTANY.

Presented to the Section on Materia Medica, Pharmacy and Therapeutics, at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1–4, 1897.

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Prior to emergence from its nameless barbaric state, the human race was undoubtedly versed in botany of a strictly practical kind. All omnivorous and vegetable feeding creatures distinguish between wholesome and poisonous plants. Even the butterfly selects the right species on which to deposit its eggs, often from among others that to our eyes are almost identical with it. As our race has advanced in civilization, owing its progress to a more and more rigid division of labor, with the attendant and ever increasing specialization by which each piece of the great machine does its work more perfectly, yet more and more completely loses its direct touch with all but a few of the other parts, most men have lost much of what was at first common to all; and this is, perhaps, quite as true of a knowledge of plants as of anything else. As we go from the higher to the more primitive civilization of the present time, we approach by successive steps toward what was at one time characteristic of the entire human race. The country boy has names for most of the plants that the city boy passes by perhaps with a vague notion that they have no names, and he knows abundant uses for many of them. Many is the time that I have hunted sweet cicely and pipsissewa, wintergreen and sarsaparilla in the Connecticut woods; and hoarhound and boneset, yarrow and wormwood are still to be found in the kitchen or the attic of most New England farmhouses. In less favored parts of the globe, where the farmer is a peasant, and the peasant often little better than a clodhopper, this sort of knowledge is even more extensive and widespread.

It is said that the mongoose, when bitten by a cobra, runs at once into the jungle and seeks out a plant which it recognizes and eats as an antidote. Whatever the actual knowledge and its value may be, it is certain that every primitive community believes in the healing virtues of many plants and makes use of them for these supposed virtues; and this sort of knowledge was undoubtedly the first that came after

the power of discriminating between plants that are edible and those that are not. Among many people considerably removed from the aboriginal state, even today, the only conception of a collection of herbarium specimens is that they are for some medicinal use.

Recently in turning to the periodical cases in our library for a reference, my eye fell on a nearly forgotten volume of the *Botanic Advocate*, published in New Haven in 1843, and on opening it I found it to bear the legend: "The tree of life yielded her fruit every month, and the leaves of the tree were for the healing of the nations." The journal was published by the Connecticut Botanic Society, and I observed that it contained a series of three articles on the subject assigned me, "Medical Botany," the titles of which were "Lobelia Inflata," "Capsicum Annum" and "Myrica Cerifera." Lobelia and calomel were mentioned on nearly every page and appeared in the titles of many of the articles. It is probably unnecessary to say that the journal and the society of which it was the organ were Thomsonian! Independently of the herbalists, however, the botanists of a generation or two ago were physicians, and M.D. today is not an uncommon suffix to the name of a botanist, so that the subject assigned to me would seem to be an especially appropriate one for a gathering of medical men.

A very large part of the remedies applied by the physician today are of vegetable origin, and this branch of materia medica is an important part of the course of study of a physician. But this, as above said, is the age of specialization; it is the age of druggists and prescription clerks, of triturates and fluid extracts, and of laboratory synthesis. Few, indeed, are the physicians who can make a tincture or an alkaloid salt as well or as cheaply as the druggist or the manufacturing chemist, and, under needful restrictions, the latter are turned to by the physician as certain to supply the things needed in a pure and assimilable form, and in any desired proportion. Even water for the physician's use, that was first employed as it came from the well, the cistern or the brook, then boiled before use, and then turned over to the druggist for distillation, so that it could be procured in a pure and safe form for critical purposes, is finally coming into the hands of people whose exclusive business is the distillation and purification of water. The materia medica, like one's clothing, is more and more something to be ordered outside rather than a legitimate subject for home manufacture.

And so it has come that the study of medical botany has today fallen to the pharmacist to a larger extent than to the medical student. He, indeed, is expected to know his botany well. He need not be a vegetable physiologist or a mycologist, and karyokinesis may possibly be a process of which he never heard, but in certain lines he must be a botanist. As a result, we find studies of this kind omitted from the medical curriculum proper and given place in that branch of medical study which has come to have a name and a place of its own—pharmacy.

Whether taught in the medical school or the school of pharmacy or the school of botany, the knowledge which the collector and the manufacturer of drugs needs is of the most practical and useful character. A knowledge of the affinities of plants will very often lead the manufacturer to experiment with species related to those which yield useful products. You are all familiar with the various cinchonas and their relative quinin-producing properties. But in the main the knowledge which is needed is that which enables one surely to distinguish one certain plant in all its forms from all other plants. Every few years the drug trade is exercised over substitutes offered more or less honestly by collectors and jobbers. It is only a short time since cascara sagrada, the bark of *Rhamnus Purshiana*, was replaced very considerably by the bark of a related species, *Rhamnus Californica*, the latter of much inferior quality. It is also only a few years since the trade journals contained an extensive description of the substitution of the roots of *Polygala alba* for the senega snakeroot, *Polygala Senega*. Not many years ago, a sample of tansy which was submitted by a large wholesale house proved, probably as the result of a clerical blunder, to be pansy.

The direct solution of problems of identity like the preceding is the closest link between botany and pharmacy, the most obvious medical botany. It is a branch of the study of vegetable pharmacognosy. The last instance mentioned is a very simple one. The merest tyro could detect the mistake and guess pretty closely at the cause for it; but in the other cases a discrimination between the things to be compared proved decidedly more difficult.

As they come to the wholesaler and the manufacturer, drugs are apt to occur in the form of more or less fragmentary root, rootstock, bark, leaf, flower, fruit and seed. Only rarely, as in the case of opium, are the active principles collected to any great extent freed from the parts of the plant which produces them. Hence, in the great majority of cases, the medical botanist is expected to accurately name certain parts of fairly well-known plants.

It has, unfortunately for this purpose, been the habit of descriptive botanists to aim at as brief a diagnosis of each species as possible, and to use those characters which most surely and most readily serve to separate it from its congeners; or else, as is the case with much modern work, what are felt to be the less variable and consequently the surest and most permanent characters have been taken as the basis of classification, many of the more obvious features being left entirely undescribed. The result is that a person who uses the ordinary manuals of botany, unless he is quite expert as a botanist, requires flowering or fruiting specimens as a preliminary for the determination of their names, and very much of the botany taught in schools and colleges, being based on and preparatory to the use of these manuals, is confined to a study of the characters employed in them.

Medical botany, if well done, must start from a somewhat different standpoint. It by no means follows that a plant which can be determined by aid of the usual manuals only when it is represented by perfect flowering and fruiting material, can not be known with almost or quite as great certainty when neither flowers nor fruit are present. Except in certain genera, like the oaks and plums, the trees and shrubs of our flora may be known with quite as much certainty in the winter when destitute of flower and fruit, and even foliage, as in the summer season; but in the absence of manuals based on their winter characters, this knowledge is possible only as the result of individual observation and investigation, based primarily on a knowledge of the species derived while their summer characters are present; and the same is true, to a greater or less extent, of all of the fragmentary, or as the botanist would call it, imperfect material

that passes through the hands of the medical botanist.

The characters which the latter makes most use of are histologic characters. Where sufficiently large fragments of root or rootstock, leaf or fruit or seed occur, these may of course be used, being subject to whatever preparation is necessary to bring them into a condition fit for comparison with either living or preserved authentic specimens; but it is only exceptionally that a superficial comparison is sufficient. Usually the distribution of the woody tissues and ducts and of the bast fibers within the specimen, the occurrence of resin passages, oil cells or latex tubes, the character and the distribution of stomata and palisade cells in the leaf, the occurrence or absence of pubescence and superficial glands, and the structure and grouping of the hairs and the structure of the seed shell have to be looked into. Sometimes, also, it is necessary to test the degree of lignification of certain cell-walls, to determine the nature of secretions, and to examine, both morphologically and chemically, the starch contained in the specimen, which is compared in each of these respects with authentic standards.

Evidently this practical botany of medicines rests upon a more or less intelligent conception of botanic classification, but is itself the application of a special skill. Quite recently a professor of pharmaceutic botany in one of the leading colleges of the country published a laboratory manual which may be held to represent his ideas as to what should be taught in preparation for it. A general knowledge of the parts of the plant, root, stem, leaf, etc., and of each of the principal tissues of the higher plants, is accompanied by a rather thorough examination of several plants of medicinal value or related to medicinal species. As thorough a knowledge as may be of a few plants is sought for, instead of a little knowledge concerning a great many, in the expectation that on this the student will subsequently build an equally thorough knowledge of all of the plants coming within the range of his observation. Not many years since another successful teacher of the same subject laid down the essential thing as being "that the course should be sufficiently comprehensive to equip the student if he desires at its conclusion to pursue further investigation of the study by himself, that is without all assistance other than books such as manuals, class-books, floras, etc." To accomplish this he divides his classes into sufficiently small sections to place specimens of each subject taken up in his lectures into the hands of all pupils, keeping before their eyes at all times on the walls of the room, a carefully labeled set of specimens illustrating the same things, and closing his course by an exercise in which a lot of mixed, unnamed material is placed on the lecture table and sorted out by the professor and students, the characters utilized being indicated step by step during this exercise.

Here, if anywhere, object teaching is essential, and each of these courses is taught as a series of object lessons. Gross characters are made out by the aid of the naked eye and simple magnifying glasses, but for others the compound microscope is brought into requisition and some of the pharmaceutic schools have as a part of their curriculum a regular course in microscopy. Unless it be biology, no word is more abused than this; but for our purpose a sufficient working knowledge of the optic and mechanical parts of the microscope and ability to make serviceable temporary and permanent preparations, is treated as of far greater value than the ability to resolve difficult test objects and to run an unimpeachable ring of Brunswick black or shellac. All that is useful in the technique of the zoologist, the botanist and the embryologist, is utilized to get serviceable sections cut with intelligence at a point calculated to show representative structure, and the skill of the chemist is made to yield, under the cover-glass, reactions as characteristic in their way as those obtained in the test-tube or before the blow-pipe. Equipped in this way, the student is able to determine those characters afforded by his material which enable him to say with certainty that it is or is not the same as a standard specimen of the thing to be compared with. Primarily he is called on to recognize this identity or difference in comparison with the plant that the material is supposed to represent. If it be different the question as to what it really is is only a secondary one, and as his knowledge increases he becomes more and more able to answer these accessory questions.

A good description is more available for use than a poor specimen, and the time is coming when this, as well as each other branch of technical botany, will be equipped with manuals employing the characters which are available in the class of material that must be studied. Perhaps the progress of American systematic botany has been retarded more by the easily acquired habit of naming new specimens by matching them in the herbarium than in any other way; and the best workers, now that monographs are increasing in number, turn first to a monograph and determine a specimen by the aid of the descriptions before going to the herbarium. But what is a good description today may be a very poor description five years from now, owing to the discovery of new material influencing the limitation of species. Hence a specimen is always potentially better than a description, since the former is the thing itself, while the latter is only a more or less subjective interpretation of it, and in medical botany, as in general botany, the herbarium is of prime importance.

The medical or pharmaceutic herbarium should differ from the general herbarium in containing only medicinal plants and their nearest allies. One familiarizes himself with an herbarium of a thousand sheets where he is utterly at sea in a collection of a quarter of a million specimens. The specimens contained in this technical herbarium should be perfect from all points of view:—good in the sense of the ordinary botanist as representing the technical characters which he uses in classifying each plant; good from the standpoint of the person who does not know general botany in representing every part of the plant which he may find in a disconnected condition and wish to compare; good from the standpoint of the histologist as affording usable material for sectioning and microchemistry; and good from the standpoint of the investigator in offering abundant material for study and comparison. Where the woods can be turned to by the student the herbarium specimens are easily supplemented when needed by freshly gathered material; but manufacturing pharmacists, like other manufacturers, drift into large cities where this is often inconvenient or impossible. Not long ago it was said in one of the leading druggists' journals that "the pharmaceutic profession more than almost any other, is interested in the proposition to establish a great botanic garden (referring to the then proposed New York garden). As scien-

tific principles become more and more extensively incorporated into the practice of pharmacy, there is increased recognition of the necessity for a practical acquaintance with the sources of our drugs. This does not of necessity imply an extensive knowledge of theoretic botany, desirable as that is, but a thorough personal acquaintance with medicinal plants is of the greatest value to him who must daily discriminate against substitutions, adulterations, inferior varieties and collections and deteriorated samples. The ideal opportunity for cultivating this acquaintance is in the botanic garden, where we have brought together for immediate comparison the doubtful species under consideration in a living state, and where the characters thus observed can be followed up closely in the herbarium and materia medica collections forming adjuncts to the garden." Besides what can be preserved in the herbarium proper and the garden, the reference collection ought to contain standard material of all drugs in their crude form, so that any changes in appearance which the specimen under study may have undergone during its preparation will be likely to be matched by a corresponding change in the standard; and besides the museum material here referred to, which is most readily utilized by the investigator if kept boxed in immediate connection with the herbarium sheets, a set of histologic preparations ought to be made, representing not only the tissues of each officinal plant from authentic specimens, but also such preparations as can be made from the fragmentary drug, of which good sections are often obtained with difficulty, while the mode of fragmentation is sometimes characteristic.

Today nearly all students are taught not only to observe, but to record their observations, both in writing and by means of sketches. The medical botanist, perhaps more than most others, is likely to be benefited by forming this habit. A sketch made while the study is fresh in one's mind, somewhat idealized, not by the introduction of fanciful details but by the omission of confusing structures which one sees in all preparations, renders the future examination of a slide much easier and the conclusion drawn from a comparison with it more certain. I should therefore sketch the essentials of every preparation so preserved, and while the matter is fresh in one's mind a brief memorandum is easily written in connection with the sketch, describing differences between related things that may be transient in the slide or liable to be overlooked.

Medical botany, therefore, as a technical study for the manufacturing pharmacist and collector, and to a less extent for the dispensing druggist, but hardly for the medical man, in my mind is really a minute acquaintance with each plant used in medicine, with each of its parts in the form in which they are employed for the extraction of the drug as finally used; and it is properly learned by a course of study limited to very nearly the lines sketched above. Having reached this point, the botanist very properly, if time permits, extends his knowledge of general botany. Before this point, if he know the meaning of a generic and a specific name, of a natural family and a variety, he is enough of a botanist to do his work well.

To the physician of today, medical botany, which only a few years ago seemed to be passing from his hands, is returning in twofold form, but it is doubtful if the great majority of physicians are justified in dipping very far into it. Occasionally poisoning by eating certain toadstools, or roots of a few umbellifers, demands a certain amount of botanic knowledge, but I take it that in practice the suspicion of this poisoning is as practically useful as the actual knowledge of the plant which has caused it. The dermatologist, more than the general physician, is called on to recognize causes for dermal manifestations which he often traces to the use of food of one sort or another, which in some cases the idiosyncrasy of the patient reacts to in rather a marked way, and it is only a few years since a professor in the Harvard Medical School published an exhaustive treatise on the plants which produce such effects. A few plants, like the poison ivy, are very pronounced external irritants. But so far as practical purposes are concerned, the physician needs to know to what to ascribe certain manifestations of this sort, very much as he needs to know the effect of certain drugs, rather than to have a botanic knowledge of the irritant.

With the growing knowledge of bacteria, however, a more directly necessary branch of medical botany seems to be opening up. It is not necessary for the physician to know all bacteria, perhaps hardly necessary to know any large number of pathogenic species; but tubercle, leprosy, cholera, and certain other diseases of frequent occurrence, are so clearly marked by the occurrence of bacteria in or about the diseased tissues, that a diagnosis is often made with certainty only after a bacteriologic examination has been made. The Widal test for typhoid fever now has come into general use, and in the case of cholera and diphtheria it is, I believe, generally recognized that an easily made pure culture of bacteria from the patient affords the surest and quickest information as to the positive occurrence of the disease.

Today I suppose that there is not a good medical school in the country which has not a well equipped bacteriologic laboratory. The teaching needed for this branch of medical botany, like that needed for the older medical botany, which is now more properly regarded as pharmaceutic botany, ought to be of the most directly practical kind. A knowledge of methods first and of facts afterward is what is demanded. Some bacteria, the ordinary aerobic species, are so easily isolated and grown in pure cultures that the means of doing this ought to be at the hand of every physician, though I observe that certain boards of health are now undertaking to supply the apparatus and culture media needed for diphtheria work, so as to reduce the practitioner's part to the minimum of manual manipulation. The preparation and examination of slides offers little difficulty to the medical student who is already equipped with a knowledge of microscopic and histologic technique, so that he readily learns the special treatment needed for this sort of work. Here, as in pharmaceutic botany, the reference to authentic descriptions and authentic material becomes more and more necessary in proportion as one passes from hasty diagnosis to scientific investigation; but just as the dispensing druggist is becoming more and more freed from the routine of botanic examination, so the exhaustive study of the etiology of any germ disease is passing more and more from the physician to the medical bacteriologist who specializes in this direction, and whose training, built on a broad clinical experience, is supplemented by a continuation of the preparatory studies which the ordinary physician is obliged to make. The difference is in degree, however, rather than in kind.

DISCUSSION.

Professor REMINGTON—The subject of botany itself, except the coarser structure of plants and bacteriology, has passed from the curriculum of the medical colleges and is now taught as a primary branch in the pharmacy colleges. I think that there is very little probability of the restoration of medical botany to its former place in the medical school; but it is well to know that it is taken up in other schools.

Dr. PAQUIN of St. Louis—The great difficulty in regard to the study of botany by medical men is want of time, but this must be provided for, as bacteriology is going to develop enormously in the near future.

PHARMACEUTIC CHEMISTRY, PHARMACOLOGY AND PHARMACO-PHYSICS THE NATURAL STEPPING-STONES TO SCIENTIFIC MEDICINE.

Presented in the Section on Materia Medica, Pharmacy and Therapeutics at the Forty-eighth Annual Meeting of the American Medical Association held at Philadelphia, Pa., June 1-4, 1897.

BY ALFRED R. L. DOHME, Ph.D.

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Before entering upon a discussion of the subjects embraced by all the above caption, it might not be out of place to make clear what the exact meaning of the terminology that will come up for consideration is. Some little confusion has arisen recently, because of the double use of the word pharmacology, and the dictionaries do not help us out in the matter. They define pharmacology as the study of drugs both as to their recognition, properties and therapy. In other words, it is a general term for the study of drugs and their therapy, or a combination of pharmacy, the science of compounding drugs, with materia medica, the description of drugs and their medicinal effect. This is in accordance with the derivation of the word, which is made up of the Greek words, *pharmakon* and *logos*, meaning a discourse on or a study of drugs. However, the word has also been used, especially in Germany, to mean the study of the physiologic effect of drugs on the human system. Thus, when acetanilid is taken into the stomach and produces certain results or effects, it is the province of pharmacology to study and explain what organs, tissues, fluids, etc., of the body are affected by the same and in what way. Pharmaceutic chemistry has to do only with the chemistry of drugs, *i. e.*, given a drug, say belladonna root, it is the province of pharmaceutic chemistry to discover entirely what the same contains and in what relative quantities, thus: atropin, hyoscyamin, hyoscin, starch, resins and which, fats and which, malic acid, etc. Pharmacognosy is the study of the various physical properties of drugs which will enable one to recognize them, including their history. It hence embraces their botany, microscopy, histology, the chemistry of their constituents and the history of their use as a drug. Pharmacodynamics is a term that has been employed to express the effect and uses of medicines, being derived from the Greek words *pharmakon*, a drug, and *dynamikos*, the power or effect, and is hence practically the same as therapeutics. In considering the study of the effects of drugs upon the human economy, it appears to me that we have to become acquainted with the following facts in order to get at a scientific knowledge of how drugs act. We should know all the constituents of the drug we desire to use; we should know the physiologic effect of every constituent of the drug we are administering and, then, use only those constituents, or preparations containing only those constituents that produce the effect we desire to produce; and we should know the cause of the effect of each of these constituents. The first embraces the pharmaceutic chemistry of the drug, the second its pharmacology and the third its pharmaco-physics, which last word I have coined, as I believe there exists no word to express the study of the causes of the effects of drugs. It would be well to make clearer, perhaps, the distinction intended to be conveyed by the terms pharmacology and pharmaco-physics, and a concrete example will best serve to do this. Let us take acetanilid, as this will serve our purpose quite well and is besides one of the most generally used drugs. The pharmaceutic chemistry of acetanilid is the study of its formation, properties and decompositions. Its pharmacology is the knowledge resulting from the study of its physiologic effect on all the organs, tissues, fluids, etc., of the body, thus making plain what effect it produces, when we administer it, on the heart, blood pressure, nerve centers, liver, kidneys, mucous membranes, blood, lymphatics, etc. Its pharmaco-physics is the knowledge resulting from the study of the cause of the effects observed in studying its pharmacology, and would represent the study of the physiologic effects of all the groups contained in the acetanilid molecule. Acetanilid is made up of the group of acetic acid or acetyl (CH_3CO) and anilin ($C_6H_5NH_2$), which in turn is made up of the ammonia radical, amid (NH_2), and of benzene (C_6H_6), a hydrocarbon produced by the destructive distillation of coal. The province of pharmaco-physics would be to discover whether the effects of acetanilid, which we observed in studying its pharmacology, were due to the acetyl group, the ammonia group or the benzene group; or, what is more probable, which of the various effects of acetanilid was due to each and all of these constituent radicals of the acetanilid molecule. This can be done very readily by varying the various radicals and observing the failing or modification of this or that effect. Thus, if the red corpuscles are precipitated, producing cyanosis and eventual collapse, is this due to the ammonia radical (NH_2), or the acetyl radical or to the benzene radical, present in the molecule? Further, if the blood pressure is diminished, to which of these radicals is this due, etc.? If this is tabulated and known, for the various drugs of our pharmacopeia, we will reach such a desired and advanced stage in our knowledge of medicines, that we can control the unpleasant and undesirable effects of our remedies entirely and produce and use only such remedies as will produce just the effects we desire and no other effects. This is not only true of synthetic remedies but of all remedies, inorganic as well as organic. No doubt this appears chimeric to many and beyond the limits of probability and also usefulness, because of its apparent complexity, but there can be no doubt at all that it is not only among the probabilities, but that it is the natural evolution of the science of medicine that will take place in the next fifty years. German schools of medicine are entering upon this enormous and as yet untrodden and fertile field of investigation, and we should give it the attention that its importance merits. It is not a matter that can be taught, because it is as yet an unknown or practically unknown science, but it can and should be made the subject of investigation and study, so that we may become acquainted with the facts that it will give us, and enable us to make use of them in administering medicines. How few physi-

cians today know the exact effect of the medicines they prescribe on the various organs, and what is the cause of that effect? They know that jaborandi produces activity of certain glands, resulting in increased secretions thereby, and they know that the pilocarpine in these leaves produce this effect, but do they know what other effects pilocarpine produces on the other organs, say on the blood, liver, kidneys, etc., and do they know what causes pilocarpine to produce this effect? They may say that it is not necessary for them to know this, as the effect is produced just the same and that is all they desire. This is quite true, and in the present state of our knowledge of medicines and their effects it is about all they can know; but would their ability to combat disease and administer medicines more scientifically and effectively not be many times increased if our knowledge of these same medicines and their effects and the cause of the effect, were known to them. They would then know that since, we will say for example, pilocarpine interferes with the functions of the liver it is not advisable to use this drug for a patient who requires a diaphoretic, but at the same time has a diseased liver. We might perhaps have learned by that time that a certain radical in the pilocarpine molecule produced the untoward effect on the liver, but that pilocarpidine, while still an effective diaphoretic, no longer produced this effect on the liver, due to the elimination from its molecule of the undesirable radical present in the pilocarpine molecule. There can be no doubt of one thing, and that is that medicine in its narrow sense, *i. e.*, the science of the administration of drugs, has not advanced at the same rate that the sciences of surgery, bacteriology, pathology or anatomy have during the last half century. In fact, many physicians have grown skeptical as to the value of drugs and think the less of them used, as a rule, the better. The development and future above outlined for the science of medicine in its narrower sense, will, unquestionably, remove all such skepticism and push therapeutics forward as a most necessary and invaluable requisite for the combating of disease. I may be pardoned when I say that scientific medicine, *i. e.*, the scientific administration of drugs, is only in its infancy at present, and that most of our medicines are administered empirically, *i. e.*, are administered not because we know exactly why they are what our particular case in hand calls for, but beeause experience has taught us that they are effective and will produce certain results. I do not wish to be misunderstood in this connection, and when I say the administration of medicines is largely empirical I do not mean to state or imply anything derogatory, but merely to say that our present knowledge of the administration of medicine does not enable us to do anything better. My purpose in going into this detail as to empiricism vs. science is merely to explain the meaning intended to be conveyed by the term scientific medicine in the title of the paper I am presenting. All physicians will agree that it is desirable to increase our knowledge of pharmacology and pharmaco-physics, for the more they know about the effects of drugs and their cause the better off they will be in successfully combating various diseases. There is one obstacle, however, to success in this direction in this country and which does not exist in Germany, and that is the indifference or unwillingness of hospital and clinics to take up and try, carefully and scientifically, any new preparations that may be offered them for experiment. The necessary thing to be done in this country to make the development and study of pharmacology successful, is the adoption of courses of lectures on these subjects, together with the opening of laboratories for their experimental study and research. In Germany chairs of pharmacology are established at almost every university, and at several of them the work in the lecture room is supplemented by actual experiments and actual investigations and study in the laboratory and clinic. Thus, the laboratories of Professor Schmiedeberg in Strasburg, Baumann in Freiburg, and Drechsel in Leipzig, are headquarters for this work in Germany, and their number is steadily growing. It has not been so many years ago that in order to study the new science of pathology one had to go to Berlin, to Virchow's laboratory, but Virchow has gradually developed other capable teachers and expounders of his theories and methods, and now pathology is a part of the course in medicine in practically every college in this country. So it will be with pharmacology and pharmaco-physics. The pupils of Schmiedeberg, Drechsel and Baumann will organize laboratories and courses, just as their instructors did, and the result will be that every school of medicine will embrace as part of its curriculum lectures and laboratory work on pharmacology, and perhaps also pharmaco-physics. Some schools of medicine have such courses already, as, for instance, Johns Hopkins, Harvard, Pennsylvania, Ann Arbor, etc., and others will unquestionably adopt the same in the near future. When this is brought about, the era for the scientific administration of drugs, *i. e.*, scientific medicine, will set in, and the stepping-stones to reach that stage will be pharmaceutic chemistry, pharmacology and pharmaco-physics.

THE NATURE OF THE LEUCOCYTOSIS PRODUCED BY NUCLEINIC ACID; A PRELIMINARY EXPERIMENTAL STUDY.

Presented to the Section on Materia Medica, Pharmacy and Therapeutics, at te Forty-eighth Annual Meeting of the American Medical Association, Philadelphia, Pa., June 1-4, 1897.

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Within the past two or three years there has come into gradual prominence a system of therapeutics known popularly as nuclein therapy, which is attracting more and more attention and receiving a growing recognition at the hands of the medical profession.

The use of nuclein was first advocated on purely theoretic grounds, it being claimed that by its use the germicidal power of the blood could be increased and hence the resistance to diseases of germ origin heightened. Of late, however, certain writers have denied that nuclein acts as it was supposed to, and in consequence, its use being founded on a false conception of its powers, have claimed that it was not beneficial.

The application of nuclein to the treatment of certain diseases, especially to certain of the infectious processes, seems to be attended with beneficial results, though the observations are as yet too few and too incomplete to be of much value. Such as they are,

however, they tend to confirm the views on which its use was first advocated and should be taken for what they are worth.

In order to fully comprehend the point at issue, it will be well to briefly review the various steps that have led to the discovery and use of this interesting substance.

Ever since the announcement of the fact that normal blood plasma of man and animals possessed definite germicidal power, endeavors have been made from time to time to determine the nature of the substance that imparted this property to the blood, in the reasonable hope that with its discovery we would be put in possession of the means to artificially increase this bactericidal property at will, which it is readily conceded would be of considerable importance in the treatment of certain diseases.

As early as 1872, the fact that organisms when injected into the circulation rapidly disappeared was observed by Lewis and Cunningham.[1] Similar facts were recorded from time to time by a number of observers, among whom may be mentioned Traube,[2] Fodor,[3] Wysokowicz,[4] Grohmann,[5] Nuttall[6] and others, and numerous theories, which it would lead us too far to mention or discuss at this time, were advanced to account for the apparent destruction of the invading organisms on the part of the body.

No explanation not open to serious objection was offered until the publication of the work done by Nuttall under Flüge. He claimed that the injected organisms disappeared because the normal plasma was germicidal and destroyed them. He gave positive evidence of this fact.

Following the work done by Nuttall, Nissen,[7] also working under Flüge on the same question, came to the following conclusions among others: 1, that normal blood plasma can easily destroy the cholera germ and Eberth's bacillus; 2, that the addition of small quantities of sterilized bouillon or of normal salt solution would not destroy the germicidal property of the blood; 3, that for a given volume of blood there is a maximum number of bacteria that can be destroyed; 4, that blood rendered uncoagulable by the addition of peptone is still germicidal; 5, that blood the coagulation of which is prevented by the addition of 25 per cent. of magnesium sulphate has its germicidal property diminished; 6, that filtered blood plasma from the horse is germicidal.

While, then, it was clearly proved that normal blood possessed certain properties detrimental to the growth and development of bacterial life, it was not as yet shown to what this property was to be attributed. Among some of the ideas advanced may be mentioned that of Behring,[8] who believed that the germicidal action of the blood of certain animals was due to its great alkalinity.

Metchnikoff[9] attributed the ability of the blood to destroy bacteria to the power of certain of the white cells of the blood, the polymorphonuclear leucocytes, to devour the micro-organism, to their *phagocytic* power, as he termed it. That these cells can and do act in this way at times can not be denied, and nothing is more attractive than to watch one of them surround and engulf a malarial parasite in the blood on the warm stage. That the true germicidal property of the blood does not lie in this action of the leucocyte was shown some time after by Buchner, who killed these cells by freezing and then thawing the blood, when its power to destroy micro-organisms was found to be undiminished. Buchner[10] further came to the conclusion, from a series of experiments that it is not necessary to review here, that the actual germicidal substance in blood was its serum-albuminous constituent.

Vaughan,[11] in a paper read before the medical section of the First Pan-American Medical Congress, in 1893, showed positively that this conclusion of Buchner must be erroneous, since it is known that whatever the substance in the blood is that possesses germicidal properties, it is not affected by peptic digestion, while serum-albumin is readily digested, as is well known.

From that time to the present numerous papers on this most important subject have appeared, and as many attempts have been made to clear up the question by the various theories that have been advanced.

It would only be necessary to mention the names of some of the investigators to show that the greatest activity has prevailed in this particular field of research. Among those who have followed Buchner may be mentioned Pruden,[12] Rovighi,[13] Pekelharing,[14] Hankin,[16] Bitter,[17] Christmas[18] and a score of others, each with his own set of facts and consequent deductions. Suffice it to say that to each one there seemed to be some reasonable objection that rendered it probable that the true nature of the germicidal substance remained in doubt up to a very recent date.

Vaughan, in the paper just cited, makes a careful survey of the literature of the subject, analyzes the work of the most important investigators and comes to the following conclusions:

1. That serum-albumin as described by Buchner is not the germicidal substance in blood serum, since it is readily converted into peptone by peptic digestion, and still the germicidal property of the blood is unaltered. Peptone further is favorable to the growth of bacteria and is used in preparing nutrient media.

2. That the germicidal substance must belong to the proteids, otherwise it would be difficult to explain the fact that a temperature of 55 degrees C. renders blood serum inactive.

3. That the only proteid likely to be present in blood serum and which is not destroyed by peptic digestion is *nuclein*.

He then asks the following questions: 1. Is there a nuclein in the blood? 2. Has this nuclein, if present, any germicidal properties?

Without reviewing Vaughan's work, it is only necessary to say that he succeeded in isolating a substance from the blood which is undoubtedly a nuclein, and that he and a number of others have demonstrated the fact that it has very decided germicidal properties. It is therefore safe to say that we may now consider blood plasma to be germicidal by virtue of the *nuclein* that it contains.

Having then reached this important conclusion let us briefly inquire into the nature of this substance. What is nuclein?

The term nuclein was originally applied to a peculiar phosphorus-containing substance which was isolated from pus. Chittenden,[19] speaking of this says, "it was discovered that this or related substances were widely distributed through nature in both the animal and vegetable kingdoms wherever nucleated cells occurred."

From a physiologic standpoint nucleins may be considered to form the greater part of the chemic substance found in the nuclei of all cells, that sub-

stance which shows such a strong affinity for certain coloring agents, and which is sometimes spoken of as chromatin. It is, speaking broadly, "that constituent of the cell by virtue of which the histologic unit grows, develops and reproduces itself." It will be readily seen, therefore, that nuclein must be very widespread and that relatively there will be more of it found in those tissues or structures that are the richest in cellular elements.

Chemically, the nucleins are highly complex proteid bodies, of weak acidity, containing a certain amount of phosphorus. They are insoluble in weak acids and in alcohol, but are soluble in dilute alkalin solutions, the action of the alkali being to liberate free nucleinic acid, or to separate it from the albuminous matter with which it is in combination. Thus viewed a nuclein "is simply a combination of some form of proteid matter with a nucleinic acid" (Chittenden[19]). Further, the nucleinic acid can be prepared from any form of nuclear material, but it is found to be most easily gotten from yeast-cells. It is "characterized by its large percentage of phosphorus, as much as 9 per cent. having been found in some forms" (Chittenden). This acid can again be decomposed by the action of dilute mineral acids, and when so treated gives as cleavage products, various kinds of nucleinic bases, the difference depending on the nature of the tissue or substance from which the nuclein was originally derived. Thus, for example, the nucleinic acid from yeast-cells yields, when treated with a dilute mineral acid, four distinct substances—bases, while that from the thymus gland of calves yields only one base—adenin. These facts are mentioned because, as is well-known, there is some close relation existing between this group of substances, the decomposition products of the nucleins, known as "xanthin bases," and the formation and excretion of uric acid, a question that we will not attempt to discuss at the present time.

Since all nucleins contain phosphorus, and since it seems that the greater the amount of phosphorus the more active is the nuclein, the amount of phosphorus which any given sample of this substance contains may be taken as an index of the amount of nucleinic acid present in the preparation.

The various commercial articles now on the market have been found to vary considerably in the amount of nucleinic acid that they contain. According to a recent report of Professor Chittenden,[19] that manufactured by the firm of Parke, Davis & Co., under the name of "Nuclein Solution from Yeast" contains the most phosphorus, and therefore is the richest in nucleinic acid. It is the preparation used by us in the experiments that form the basis of this communication.

Having seen what nuclein is, let us inquire into the nature of its physiologic actions. The use of this substance as a therapeutic agent is of such recent date, and is based on such a narrow margin of known facts regarding its action, that there is comparatively little known as to its full action on the diseased economy.[30] Löwitt[20] some time ago made the statement that, by subcutaneous injection of nuclein in animals in the ratio of 1 per cent. per kilo. of weight, he quickly produced very dangerous symptoms, such as threatened cardiac and respiratory failure. It is impossible to say what preparation he used, or how it was prepared, but most certainly our observations and those of others have been just the opposite, and we have never seen, either in animals or man, any harmful symptoms whatever even from considerable doses. That harmful results might occur if excessive doses were used may be conceived, but the same holds good for nearly every therapeutic agent, each having its proper dose and indications for its use, and there would be no occasion whatever to use doses of this preparation of such size as to produce even the mildest signs of danger. Certain effects have been noted in the treatment of tuberculosis and other diseases, with this remedy, but it is not the province of this paper to discuss these, which belong more properly to a consideration of the therapeutic uses and effects of nuclein. Whatever the other effects may be, however, there is one result of the administration of nuclein, either by the hypodermic method, or per os, that appears to be quite constant, and on which its therapeutic value is supposed to depend in the treatment of the various forms of bacterial disease. This effect is the *apparent production of a leucocytosis.*

It will be recalled that in the opening paragraph we stated that, could that substance be discovered by virtue of which the blood possessed germicidal properties, it might with reason be hoped that some means could be devised by which this valuable property could be artificially increased at will. Since the germicidal property of normal blood resides in a substance known as nuclein, and since this is derived from the nuclei of certain cells of the blood, the white corpuscles, it is believed that by increasing the number of these cells very materially the germicidal power of the blood plasma may be considerably heightened.

We have just said that one of the constant results of the injection of nuclein, or of its administration per os, was the production of an apparent leucocytosis, meaning by that term an actual increase in the total number of leucocytes per cubic millimeter, circulating in the blood. The word "apparent" is here used advisedly because it is claimed by some writers that the increase is only apparent, not real. It can readily be seen that on the determination of this important point the value of this or of any similar preparation will rest. If the results following the administration of nuclein consist only of a re-arrangement of the leucocytes in the different portions of the circulation and not of an actual increase in the number of the same, we can not hope by its use to augment the germicidal power of the blood, since we can not increase those bodies, the white corpuscles, that produce the germicidal substance.

According to those who hold the view of leucocytosis just mentioned, the effect of an injection of nuclein, or of any substance acting as it does, is to cause a determination of the leucocytes to the peripheral circulation and away from the circulation in the internal vessels. How this is supposed to be accomplished we will see later. On examining a drop of blood drawn from the finger tip, or from the lobe of the ear, as is the usual custom some hours after the administration of nuclein, it is found that there is an increase in the number of leucocytes, chiefly, though not entirely, confined to the polymorphonuclear variety, which fact is explained in the way just mentioned, it being denied that the total number of leucocytes is at all increased. According to this view

[30] This paper was written before Dr. Vaughan's recent article on the use of nuclein in cases of pulmonary tuberculosis appeared. The authors have themselves used it in a large number of such cases with apparent marked beneficial results. These it is expected will be reported later.

then, what we have been taking for an increase in the number of cells is in reality nothing more than an affair of distribution, and we would have to alter our definition of leucocytosis accordingly.

Cabot,[21] in his recent book on the blood, defines leucocytosis as: "An increase in the number of leucocytes in the peripheral blood over the number normal in the individual case, this increase never involving a diminution in the polymorphonuclear varieties, but generally a marked absolute and relative gain over the number previously present." This definition he follows up by the statement that whether or not it be true that a leucocytosis is only an affair of distribution "it is accurate to say that in the drop which we draw (whether also in the internal organs or not) the leucocytes are present in increased numbers per cubic millimeter." This leaves us in doubt as to Cabot's own view, though strongly inclining us to believe that while he has not so expressed it in as many words, he holds the opinion that in leucocytosis there is an actual increase in the number of cellular elements throughout the circulation.

Ziegler,[22] also defines leucocytosis as an increase in the number of white corpuscles circulating in the blood and points out that these may come either from a new production of cells in the cell-forming organs, from a proliferation of the cells in the circulating blood, or further that the increase may under certain circumstances be due simply to the discharge into the circulation, from the lymph glands, of large numbers of ready formed, partly matured cells.

The arguments advanced in support of the view that leucocytosis is but an affair of distribution are worthy of very careful examination. There are two chief ones on which the theory rests. In the first place it is claimed that the apparent increase in the number of cells occurs chiefly in the polymorphonuclear variety which, if we accept Uskow's theory and classification, are the mature elements. If it is true that an actual new formation of cells takes place as the result of the injection of nuclein, the claim is made that we should find the greatest percentage increase in the mononuclear or young elements. In the second place it is claimed that an examination of the blood shows that while there is an apparent increase in the number of cells in the peripheral vessels the central circulation shows a corresponding paucity of cellular elements.

These two arguments, if based on careful experimental evidence, would be very strong indeed and would point to the accuracy of the conclusions drawn. It was partly with a view to clearing up this question that the experiments which form the basis of this paper were undertaken, and we believe that from the results we have obtained, and from those obtained by others, especially by Buchner and Hahn in a different direction, which however bears strongly on the point in question, that we have reason to believe the leucocytosis following the administration of nuclein to be one in which there is an actual increase in the number of white corpuscles in the circulation. To what process this is due we are not able to state, though we are inclined to the view that there is proliferation within the cell-forming organs and probably in the circulation as well.

Before detailing our experiments let us examine more closely the two chief arguments advanced in support of the other view of leucocytosis, that first mentioned.

In examining a drop of blood, drawn, we will say from the finger of a person some hours, or a day or so, after an injection of nuclein, it is readily seen that the white corpuscles are present in increased numbers, and that the largest percentage increase is in the polymorphonuclear variety. This fact can not be disputed, and since, as Ehrlich[23] has pointed out, the blood-cell-forming organs discharge into the circulation only the small mononuclear or young elements, it seems at first difficult to explain the presence of so many of the older mature cells. The question however resolves itself really into one concerning the length of the life-cycle of a leucocyte. How long may it take for a young element to pass through the various stages in its development and become matured? Is it not probable that the mistake has been made in examining the blood too long after the injection of nuclein, so that time enough has elapsed to allow the young elements formed as a result of the injection to mature? If this is the case the first argument advanced loses it weight and becomes in reality an argument in favor of the other view.

In the course of all of our experiments we found that within so short a time as from five to ten minutes after the injection of nuclein there was a noticeable increase in the number of leucocytes in the peripheral as well as in the central circulation, and, moreover, that the greatest percentage increase was not in the mature, but in the young varieties. If it is possible then for an actual reproduction to begin within so short a time as five to ten minutes after an injection, is it not probable that the majority of these elements can pass on to the mature stage after the lapse of a day, or even of some hours? We think it is and that herein lies the explanation of the fact that when a drop of blood from the peripheral circulation is examined some hours after the injection, the increase is seen to be chiefly in the polymorphonuclear forms. The fact, also, that in our experiments we found that the small young elements were the first to be increased in the largest proportion is consistent with the view that the leucocytosis produced by nuclein at least, consists of an actual increase in the total number of white cells, and bears out the statement of Löwitt[20] that following an initial stage in which there seems to be a lowering of the number of corpuscles (which phenomenon we have not attempted to study), there is a development of young mononuclear forms which gradually pass through the developmental stages into mature elements.

Goldschneider and Jacob[24] also, though they disagree with Löwitt in some of his conclusions, support him in the statement that the injection of certain substances produces an increase in the number of leucocytes most noticeable in the mononuclear forms.

Romer[25] likewise takes this view of the process and goes so far as to say that he believes the reproduction to take place within the circulation as well as in the blood-cell-forming glands.

In attempting to explain how it is that the injection of such a substance as nuclein causes a determination of leucocytes to the peripheral circulation and away from the that in the internal vessels, it seems to us that the advocates of this theory disclose its weakness as they do in no other way.

While many writers attempt no explanation others, as Wells,[26] in a recent article states that according to his belief "the key to the whole problem is to be found in the principle known as chemotropismus, or

more commonly as chemotaxis." According to this author the effect of an injection of nuclein is to exert a chemotactic action, the result of which is the attraction of the polymorphonuclear leucocytes from the central to the peripheral circulation.

We fail to see how such an action could take place, even granting that nuclein possessed chemotactic properties, for is it to be supposed that after being injected subcutaneously the substance will remain in the peripheral circulation? Will it not naturally circulate freely throughout the system? This at least is what one would expect, and doing so it would then exert its chemotactic influence, if it had any, in all portions of the circulation, and the results would be *nil* because the various attractive forces would neutralize one another. In fact, this chemotactic explanation does not seem to us to be any explanation at all.

Aside from all the foregoing facts that seem to us to strongly militate against the idea that leucocytosis is but an affair of distribution there is another fact, well authenticated, that also points conclusively to the incorrectness of this view.

Referring again to a paragraph in the early part of this paper, it was stated that the germicidal property of the blood resided in its nuclein and that the richer in cells a part was, the more its content of nuclein, and by the same reasoning the greater its germicidal power.

Buchner, working on this question, found that fluids rich in cells possessed a greater germicidal power than did the normal blood of the same animal. More recently Hahn,[27] working under Buchner and following the suggestion contained in the above observation, has attempted to increase the germicidal power of the blood plasma by producing an artificial leucocytosis. Hahn found that the blood plasma of animals treated by hypodermic injections of nuclein solution possessed germicidal power considerably greater than the blood of the same animals had possessed before the injections. Had the effect of the injections been to cause a determination of the leucocytes to the peripheral circulation only, and not an actual increase in the total number of the same it is very difficult to explain Hahn's results which, therefore, seem to us to point very conclusively to the fact that the leucocytosis produced by this substance at least consists of an actual production of new leucocytes, increasing the number of nuclein-producing bodies and in consequence heightening the bactericidal power of the blood.

Among those who are cited by Wells as supporting the view that we believe to be incorrect may be mentioned X. Reeder,[28] who says, "as to the origin of leucocytosis we have on the ground of experimental examinations *no good ground* to believe that it is due to an increased supply of white blood corpuscles from the blood-making organs, still less to an increase of the same in the blood, or to an abnormal collection of wandering cells. It must be considered as more probable that the leucocytosis is based only upon an *insignificant increase* of the entire number of white cells circulating in the blood, in that there occurs an abnormal distribution of the same in the different vessels in favor of the periphery."

A careful examination of this statement of Reeder shows that, while in the first paragraph he states positively that there is *no evidence* of the new formation of white cells *whatever*, he goes on to say in the next that there is an insignificant increase in the total number. He would seem then to admit that a production of new cells could and did take place, even if in small number only, and in so far to contradict himself. If it is admitted that it is possible for a reproduction to take place, why not in considerable numbers as well as in small? The important fact is in admitting that they *can and do reproduce*.

Schulz[29] is also mentioned as an advocate of this view. In one experiment made by this observer, and cited by Wells, he injected into the ear of a rabbit 2 c.c. of bacterial protein and immediately withdrew blood from the other ear, in which he found on counting the leucocytes only 3,300 as against 11,100 before the administration of the protein. As rapidly as possible, counts were made from several internal vessels, the average of which was 21,500. From these figures he draws the conclusion that the decrease and therefore also the subsequent increase, is only apparent, and that at first the leucocytes left the peripheral circulation for the central, and afterward the central for the peripheral. He evidently overlooked the fact, that had he estimated the total number of leucocytes before and after the injection he would have found that in the very short time that it took him to make the experiment there had been an actual increase in the whole number of 1,300 white cells per cubic millimeter, even though the cells at the time of the count were unevenly distributed.

From all the facts that we have cited it would appear that we are justified in looking on the change in the circulation that follows an injection of nuclein as a leucocytosis in which there is an increase in the total number of white corpuscles.

The experiments that we made were all upon medium-sized dogs, and while we will not detail each one we will give the steps pursued and a few of the results which are typical of all, since with very slight variations practically the same results were obtained in all cases. Before putting the dog under ether a count was made of the leucocytes in the peripheral circulation. Ether was then administered and the same was done for the peripheral and central circulations. We made the count of the peripheral circulation before the administration of ether, because we found that the ether alone produced some increase in the number of leucocytes, the amount seeming to depend on the rapidity or slowness with which the animal succumbed to the anesthetic; a greater change was noted in those dogs that struggled the most and required the most ether. After making the counts already mentioned a hypodermic injection of nuclein solution (1 per cent. P. D. & Co.), varying from 25 to 45 minims in the different experiments, was given and counts made from both the peripheral and central circulations every five minutes thereafter up to thirty-five minutes in some cases. Care was taken to allow the animal to bleed but little, and as slight disturbance was produced by the operation as possible.

The leucocytes in the blood withdrawn were stained with a week solution of methyl violet in normal salt solution and the results of the various counts tabulated. In every instance ten counts at least were made and the average taken. The entire field of the blood counter was counted every time. In this way it was hoped to reduce the limit of error as much as possible. The general results of these experiments may be summed up as follows:

1. The administration of ether alone causes an increase in the number of leucocytes over that found in the circulation before its administration. The

amount of the increase seems to depend on the amount of ether used and the time required to anesthetize the animal.

2. Before the administration of nuclein the counts showed that the number of leucocytes in the peripheral and in the central circulation was practically the same, varying only within the limit of error, or slightly over, sometimes one way sometimes the other.

3. Following the administration of nuclein solution there was immediately, that is by the end of five or ten minutes, a noticeable increase in the number of leucocytes *in both the central and peripheral circulation.*

4. At this time the percentage increase was most marked in the young mononuclear forms, which in some instances rose as high as 60 per cent. of the whole within fifteen minutes, while at the same time the proportion of polymorphonuclear elements was proportionately low.

5. The longer after the injection of nuclein the greater was the actual increase and the number seemed to steadily rise *in both the peripheral and central circulation.*

As the title of this paper indicates, it is but a preliminary study and we recognize the fact that there are a large number of questions, upon which we have not attempted to touch, that are of the greatest interest and importance. One of these questions relates to the condition of the blood a day or two after the injection of nuclein. We believe, from certain facts that we have already stated, and from other observations that we have made, that we will find a gradual increase in the proportion of polymorphonuclear elements beginning an hour or so after the injection and gradually increasing, and that as this rises there will be a falling off in the proportion of mononuclear forms as they gradually mature. Work on this point will be begun in the near future, as well as on some others that have suggested themselves to us.

The following tables taken from our record book give the figures in some of our experiments and the percentages calculated from them. It is from these figures that the conclusions just stated were drawn. A comparison of the following tables shows that the increase in the number of leucocytes begins within a very short time after the injection and steadily rises, and that the greatest percentage increase is in the small mononuclear elements.

Table 1.—Count of the leucocytes in the *peripheral* circulation of a dog before the administration of nuclein and without ether:

Varieties.	Per-centages.	Average total No. of leucocytes per c.mm.
Small mononuclears	10.87	9,200
Large mononuclears	26.07	
Polymorphonuclears	63.06	

Table 2.—Count of the leucocytes in the *peripheral* circulation of a dog under ether and five minutes after an injection of 45 minims of nuclein solution:

Varieties.	Per-centages.	Average total No. of leucocytes per c.mm.
Small mononuclears	42.30	15,600
Large mononuclears	12.82	
Polymorphonuclears	44.87	

Table 3.—Count of the leucocytes in the *peripheral* circulation of a dog under ether and twenty-nine minutes after an injection of 45 minims of nuclein solution:

Varieties.	Per-centages.	Average total No. of leucocytes per c.mm.
Small mononuclears	39.23	20,400
Large mononuclears	18.62	
Polymorphonuclears	40.18	
Eosinophiles	1.96	

A comparison of the following tables with the foregoing will show that the increase in the number of leucocytes occurred in the central circulation as well as in the peripheral and was not therefore an "affair of distribution."

Table 4.—Count of the leucocytes in the *central* circulation of a dog under ether and before the administration of nuclein solution:

Varieties.	Per-centages.	Average total No. of leucocytes per c.mm.
Small mononuclears	15.58	15,400
Large mononuclears	18.18	
Polymorphonuclears	66.23	

Table 5.—Count of the leucocytes in the *central* circulation of a dog under ether and five minutes after an injection of 45 minims of nuclein solution:

Varieties.	Per-centages.	Average total No. of leucocytes per c.mm.
Small mononuclears	34.79	18,400
Large mononuclears	19.56	
Polymorphonuclears	44.56	
Eosinophiles	1.08	

Table 6.—Count of the leucocytes in the *central* circulation of a dog under ether and thirty-five minutes after an injection of 45 minims of nuclein solution:

Varieties.	Per-centages.	Average total No. of leucocytes per c.mm.
Small mononuclears	50.90	22,000
Large mononuclears	14.54	
Polymorphonuclears	33.64	
Eosinophiles	.91	

By comparing Table 1 with Table 4 and Table 7, which follows, it will be seen that the effect of ether alone is to cause an increase in the total number of leucocytes. There was no count made of the central circulation before the administration of ether, as we did not care to subject the animal to the pain of the operation. The evidence is very clear, however, that there is the same increase in the number of corpuscles in that portion of the vascular system following the anesthetic as there is in the peripheral portion.

Table 7.—Count of the leucocytes in the *peripheral* circulation of a dog after the administration of ether and before the injection of nuclein solution:

Varieties.	Per-centages.	Average total No. of leucocytes per c.mm.
Small mononuclears	8.82	13,600
Large mononuclears	20.50	
Polymorphonuclears	67.64	
Eosinophiles	2.94	

The figures given in all the preceding tables are taken from the same experiment. This was only one of a large number and each showed practically the same changes, the figures varying, the increase in the number of leucocytes being greater in some and less in others. The number of white corpuscles varies normally in different dogs and each one has its individual ability to react to the stimulation of the nuclein injected, this reaction however being present in every animal experimented with.

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NUCLEIN SOLUTION; A CLINICAL STUDY.

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In the medical service of an institution like the New York Infant Asylum, where a large number of infants and young children are to be cared for, many of whom are received in a very poor condition of health and with a tendency to various hereditary diseases, it is often difficult to know just how to properly treat many of the more or less chronic ailments they are apt to be afflicted with, and I have endeavored to ascertain if some one of the newer remedies would not be of benefit in those cases we used to call "scrofula," and in fact all of the cases in which we meet with enlarged lymphatic glands, and with persistent discharges from the nose and ears, sore gums, skin eruptions, etc. My attention was attracted a few months ago to the nuclein solution originated by Professor Vaughan of Ann Arbor, and I thought perhaps it would be of benefit in the class of cases above mentioned if it should really prove that the administration of the solution promoted leucocytosis, for if it should do this and if the leucocytes are, as they are theoretically supposed to be, the scavengers of the blood, should we not reasonably expect a beneficial effect from its administration in such cases? I have used the improved nuclein solution 5 per cent. per orem, and the results have been so entirely satisfactory that I will continue its use.

To be quite sure that the nuclein solution does promote leucocytosis, I made careful counts of the leucocytes in four cases, which will be described in detail further on. It will be noted, in referring to the table below, that in three of the four cases there was a satisfactory notable increase of weight during the administration of the nuclein solution. It will also be noted that in Case 1 the number of leucocytes decreased between April 9 and 24, due I think to the insufficient dose of nuclein which was probably not enough to make any real impression on the blood condition and the advance of the disease. From April 9 to 24 in this case I gave only ½ dram three times a day. On the twenty-fourth I increased the dose to 1 dram, and on May 1 to 1½ drams, and found on May 5 that the number of leucocytes per c.mm. had gone up from 6,000 to 22,000. I am, however, at a loss to account for the decrease in the number of leucocytes during the latter part of the treatment of Cases 2 and 4, but whatever may be the cause of this the cases improved very rapidly and in a satisfactory manner. It will be noted from the table that the administration of nuclein solution caused an increase in temperature in all cases. Quite early in my experiments with this preparation I reached the conclusion that until a sufficient dose was given to produce some elevation of temperature, I would not expect any very rapid improvement.

Another thing which attracted my attention was the evidently stimulating properties of nuclein solution, for when I gave it to Case 5 the child was suffering from a suppurating abscess; the amount of the discharge was markedly increased, so much so that I felt somewhat doubtful about the advisability of continuing the treatment, but did so and the results were entirely satisfactory as will be noticed from referring to the record of this case. This effect of temporarily aggravating the suppuration is a very interesting fact and well worth careful consideration, but it should not discourage us from using the remedy, for it has convinced me of the strikingly stimulating effect of nuclein and I might say, aggressive qualities of the leucocytes in endeavoring to rid the body of detrimental germs. In a case of "scrofula," if administered before suppuration commences I feel sure it will prevent it, but after suppuration has actually taken place it will increase it, but at the same time make the final cure all the more complete. I will first report the four cases in which I kept a record of weights, temperatures, increase in dose and the blood-counting.

Case 1.—O. B. Mucopurulent discharge from nose and ears. Gums and the mucous membrane of the mouth in an unhealthy condition and bleed for the slightest irritation. Chronic conjunctivitis. Very irritable. Large head. Protruding abdomen. All of the usual symptoms of rachitis. Began to administer the nuclein solution April 9; ½ dram three times a day before feeding. Temperature normal or not above 99 degrees until May 1, when I increased the dose to 1½ drams. (I began to give 1 dram on April 24, which made little impression.) It will be noted from the table that on May 5 the weight had increased to fifteen pounds and the temperature was averaging 100 degrees, while the number of leucocytes increased from 6,000 to 22,000 per c.mm. In this case it appeared that the temperature would not begin to go up until some days after the dose was increased, that it would stay up for a couple of days and then decrease again. The child began to improve in apppearance by May 5 and on May 19 was well and all of the disagreeable symptoms and complications had disappeared.

Case 2.—W. H., a weak, pale and fretful infant, extremely nervous and irritable. Enlarged lymphatic glands, large head and protruding abdomen. Discharge from nose and ears. Began treatment April 9 and it is being continued at this writing (May 22). The case has improved very much in every respect, all discharges have stopped, the formerly enlarged glands are no longer noticeable and I confidently expect a complete restoration to health in a short time.

Case 3.—A. L. Phlegmatic temperament. About same condition as Case 2. Enlarged glands, decayed teeth, discharge from nostrils. All disagreeable symptoms almost entirely disappeared at this time.

Case 4.—C. M. Discharge from nose and ears; enlarged glands, nervous temperament, condition very similar to that of Case 1. This case is now well and the treatment discontinued.

Date.	Dose.	Weight.	Temperature.	Leucocytes.
O. B., male; age, 1 year and 4 months.				
April 9.	½ 5	13 lb. 10 oz.	99 to 100 ° F.	9,000 per c.m.
April 24.	1 5	13 lb. 13 oz.	99 to 100 ° F.	6,000 per c.m.
May 5.	2 5	15 lb.	100 to 100¼° F.	22,000 per c.m.
May 19.	2 5	15 lb. 3 oz.	100 to 99 ° F.	24,000 per c.m.
W. H., male; age, 16 months.				
April 9.	½ 5	14 lb. 13 oz.	Never above 100° F.	14,000 per c.m
April 24.	1 5	14 lb. 6 oz.		20,000 per c.m
May 5.	2 5	14 lb. 10 oz.		30,000 per c.m
May 19.	2 5	14 lb. 10 oz.		20,000 per c.m

Date.	Dose.	Weight.	Temperature.	Leucocytes.
A. L., male; age, 2 years and 7 months.				
April 9	½5	17 lb. 10 oz.	100° F. for 4 days	10,000 per c.m.
May 5	1 5	20 lb. 5 oz,	after the dose	12,000 per c.m.
May 15	2 5	20 lb. 6 oz.	was increased to	14,000 per c.m.
May 19	2 5	20 lb. 12 oz.	2 5.	26,000 per c.m.
C. M., male; age, 1 year and 7 months.				
April 9	½5	14 lb. 15 oz.	Never above 100°F.	8,000 per c.m.
April 24	1 5	14 lb. 13 oz.		10,000 per c.m.
May 5	2 5	17 lb. 7 oz.		32,000 per c.m.
May 19	2 5	18 lb. 3 oz.		16,000 per c.m.

I will also report five cases in which the results of the treatment were just as satisfactory but in which I did not take time to make blood counts, as I thought the four cases above given would be sufficient to illustrate the increase of leucocytes due to the admistration of nuclein solution.

Case 5.—E. K., female, aged 3 years. Had bronchopneumonia which was followed by whooping cough; then chronic bronchitis; then there was another attack of bronchopneumonia followed by a foul smelling discharge from the right nostril and right ear. Bleeding gums, restless and irritable. I began the treatment by administering ½ dram of nuclein but soon increased the dose to 1½ drams, which produced only a slight rise in temperature, but the child improved rapidly. For a week after the treatment was begun the discharge from the ear and nostril was largely increased in quantity and the odor of the discharge also appeared to be increased. After the first week the discharge gradually diminished, first in odor and then in quantity. The child became bright and playful and finally the nostril healed and there had been so much loss of tissue that the healing process almost closed the opening. The ear healed also. The lung symptoms disappeared and within five weeks from the beginning of the nuclein treatment the child was apparently perfectly well.

Case 6.—N. R., female, aged 2 years and 6 months, listless, emaciated, chronic eczema with boils in various parts of the body. Discharge from left ear. Nuclein, 1 dram, was given three times a day and all of the symptoms, including the eczema disappeared and the child became energetic and playful. I do not attempt to account for the relief of the eczema from the administration of the nuclein, but it certainly disappeared with the other complications after only three weeks' treatment.

Case 7.—A. K, female, aged 10 months. The submaxillary glands were swollen, were large and sensitive to the touch, and it appeared as if they were on the verge of suppuration, but within a few days after the nuclein treatment was begun the glands began to subside and after four weeks' treatment the child was entirely well.

Case 8.—L. H., female, aged 1 year. A typical case of "scrofula." One of the glands was already suppurating when I began the treatment. Immediately after two more glands broke down and there were large quantities of pus thrown off. The suppurative process appeared to be hastened for a time, but within six weeks from the beginning of treatment there was no evidence of the disease remaining.

Case 9.—A. H., female, aged 8 months. Another case of "scrofula." Two glands were discharging. Soon after the administration of nuclein was begun the discharge disappeared and after three weeks' treatment the patient was discharged cured.

I fully appreciate the difficulties involved in the treatment of cases of this character with nuclein solution, but I feel that I can urge upon the profession the importance of the remedy and that it is worth while in the chronic ailments of children of the character described to undertake the treatment, but being careful to caution the parents or guardian of the child that the treatment must be carried on systematically and for some weeks and that the case must be examined from time to time and the dose carefully increased if necessary, and its temperature and weight noted, even if it is not convenient to have a blood count made. Nuclein solution can not be used successfully if it is prescribed offhand and the parents allowed to regulate the treatment without reference to the conditions above named. I am also fully convinced that most clinicians who have prescribed this nuclein solution have given it in too small a dose. I found that even young infants could take, with advantage, as much as two teaspoonsful three times a day, and if a less dose had been given the treatment would not have been successful. I found that young children take the nuclein solution more readily if the the proper dose is mixed with a little sweetened water.

SURGERY ONE HUNDRED YEARS AGO.

AN HISTORICAL STUDY

BY DR. GEORGE FISCHER.

DEDICATED TO THE GERMAN SURGICAL ASSOCIATION.

TRANSLATED FOR THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION BY CARL H. VON KLEIN, A.M., M.D.

MILITARY SURGERY UNDER FREDERICK THE GREAT.

(*Continued from page 438.*)

The third in the group was *John Christian Anton Theden* (1714–1797), whose name was often distorted by his contemporaries into Theede, Theeden or Thede. He was born in the Mecklenburg village of Steinbeck, where his father was a farmer, being the eleventh of twenty-three children, as his son-in-law, Mayer, the professor of anatomy, relates. Well versed in arithmetic and writing, he went out to service in his thirteenth year as servant and scribe, but after four years gave up this insufferable occupation to learn the tailor's trade with his brother. But this did not please him either; surgery was next in order. When he had spent three years in a barber shop without learning anything properly, he felt his ambition stimulated by the character of Odysseus, with which he became acquainted through a translation of Homer; he went in 1734 into service in Rostock, and with other barber journeymen listened to an anatomic colleague on "Heister's Manual." His travels led him to Hamburg, Lübeck and Danzig, from which place, in 1737, he entered the Buddenbrok cuirassier regiment as squadron surgeon. Active day and night, he soon won for himself the love of his superiors. As his regimental surgeon, Heise himself, prepared the medicines and had the herbs gathered for that purpose, Theden was often employed in the laboratory, and soon gained a readiness in pharmaceutic work. In a review, King Frederick William desired to make him a salaried surgeon in Berlin, which Heise wished to prevent. In 1740 Theden was ordered to the hospital of Strehlen, where he became acquainted with Schaarschmidt, Holtzendorff and Boness. There he caught the spotted fever and was taken to Breslau, from which place he went, after his recovery, to the Bohemian winter quarters. In 1741, he attended the wounded after the battle of Czaslau, and made the acquaintance of the physicians there, Drs. Siegmund Hahn, father and son, who made an extensive use of cold water and ice in external and internal diseases. Theden learned from them the application of cold water in dangerous inflammations. He was sent to take charge of 7,000 wounded Austrians in the hospital at Striegau, where he contracted dysentery. He then attached himself as battalion surgeon to the Holstein regiment, but soon left it on account of the great danger of his being impressed into the military service, and upon the recommendation of the regimental surgeon traveled as quickly as possible to Berlin. There, in the next two years, he began a regular course of study under the direction of Schaarschmidt, who interested himself in his behalf. He became a

salaried surgeon and soon gained the friendship of Schmucker, who gave him admission to his house and to his operations. Theden worked industriously at anatomy, and prepared specimens so beautifully that Vogel in Göttingen gave him 50 thalers for some ophthalmic specimens. In 1748 he entered the Treskow infantry regiment in Stettin as regimental surgeon. During the Seven Years' War he took part in the battles of Prague, Leuthen, Hochkirch and others, and directed various hospitals. King Frederick II. became acquainted with him while he was treating General von Geist, whose upper arm had been shattered; the general died and bequeathed 1,000 thalers to Theden. At the suggestion of Cothenius he was appointed third surgeon-general in 1758. A consultation is said to have called him from Berlin to Schwedt, on account of the injured foot of Duke Eugene of Würtemberg. He climbed into the carriage with the duke's courier, but they had gone scarcely a mile from Berlin when the drunken postilion tipped the carriage over and Theden's left upper arm was broken. Henckel cured him within six weeks by the application of his arquebusade-water. At the end of the war he returned to Berlin and in 1767 became surgeon of the entire artillery corps. The last Silesian war took him again to the field, whereupon he became first surgeon-general in 1786, after Schmucker's death, and when he himself was an old man; he was also made a member of the chief medical college. In the following year "Father Theden," who had served three kings of Prussia, celebrated his fifty year jubilee. The celebration with addresses, memorial medals, banquets and balls lasted three days; in addition the medical faculty in Frankfort bestowed upon him the doctor's degree. One year after Bilguer's death Theden also went to his eternal rest, after sixty years of service as general staff surgeon.

In his youth he was a religious enthusiast. Even in his later years he expressed regret for his careless early education which left his "heart for a long time callous," and felt, as he frankly confessed, a tendency toward envy which during his life cost him the greatest pains to repress. What was the cause of this envy and of his bad temper? Let us hear and wonder; Theden supposed that in the act of procreation the soul of his father had been ruled by those emotions. This drove him from Hamburg, because his religious principles were not strong enough to withstand the temptations of that city. As a squadron surgeon he took instructions from the Pietists, and soon entered the order of Free Masons. When he was taken with spotted fever he desired to take the sacrament and was so tormented by conscientious scruples that he begged a Magister to convince him of the existence of God. If one considers that Theden had very little general culture, but made a very creditable record for himself, it may perhaps explain his self-complacency and the frequent obtrusion of the first person, which gives his writing an unpleasant flavor. The following are samples of this: "I write not from mercenary motives . . . am too proud to pass as a mere copier . . . do not desire to become famous and am satisfied if I can only be useful . . . am sympathetic by nature, and therefore avoid all operations so long as there is any other remedy at hand . . . am above self-love, thank heaven! and have just as little tendency to boast as to maliciously censure and defame other men. . . ." A quarrel, which his son-in-law Mayer had with his colleague Walter, moved Theden to write to the latter two letters, which Walter's son purposely published with all their orthographic mistakes. He says in them: "I consider myself a suffering Christian, and should it not be possible for you to withdraw this unhappy hatred against me, then I shall even be patient in the issue, for my days are passing, and I should consider it in the place of others an offense to God, inviting my own damnation, if I in repeating the Lord's Prayer should ask forgiveness as I forgave my debtors" (1779). Later he threatened the aged Walter, saying that he could tell His Majesty many things that would not be agreeable to him. When Theden in his eighty-first year published the third volume of his new "Observations," he took "leave for the last time of his dear friends and of his enemies, nevertheless dear to him. The applause and love of the former have made the best part of the happiness of my life. I have only two or three enemies. I will soon go before God in perfect peace, and to all my enemies I extend the wish that they may pass to eternity in due time just as peacefully." Theden was greatly afflicted with illness; besides that already mentioned he suffered in consequence of excessive tobacco smoking and tea drinking (for instance, in Hamburg he was accustomed, morning and afternoon, to drink over two pounds of the "cursed tea-water" with milk, for thirty-two years, with nausea, continual vertigo and severe hypochondria, insomuch that in his youth he often thought he would throw himself into the river. Instead of taking such a cold bath, he resolved to take water in great quantities internally, and was afterward very well. His continuous good health during his last forty years, excepting for a cracking of the skin from which he suffered for ten years, and which he believed he owed to the daily drinking of five to seven quarts of cold water, thereby taking up the lance in favor of the water-doctors, who were at that time bitterly reviled.

Among Theden's innovations his arquebusade-water made a sensation. As Schmucker had kept his eye-wash secret, Theden did likewise with his remedy: "I had sufficient reasons for not divulging this at once." In 1782 the world received notice of an improvement in this remedy, by which, instead of the so-called sorrel-water, vinegar was used in the arquebusade. For the tincture of antimony he used a new preparation which made him an expense of several hundred thalers, as he himself usually prepared most of the medicines which he used as surgeon-general, in order to have them as good as possible. When the Sardinian ambassador to Berlin, the Marquis von Rosignan, had shown him India-rubber, which de la Condamine first described minutely to the Paris academy in 1751, Theden undertook to make surgical instruments from the solvent resina elastica (in naphtha vitrioli or sulphuric acid according to Macquer), which was then very expensive. He made elastic catheters principally, which he in 1777 introduced to A. G. Richter, afterward his friend, by means of a circular, and sold for six thalers apiece, or four for three Louis d'or. He also made breast-pumps out of India-rubber which were very similar to those at present made of shell, upon which a funnel-shaped sucking-bottle was placed which drew out the nipple. In later years he lacked the time to make the instruments himself. Among his other improvements should be especially mentioned a method named for him of en-

veloping the limbs from the fingers and toes upward for the resorption of exhausted fluids, particularly after unsuccessful bleeding and the aneurysma spurium arising therefrom in old sores, dropsies, varices, contusions, and also for the alleviation of pain in certain operations, as in the opening of a felon. Theden made himself further known through his concave splints of walnut for fractures, his polyp-tweezers and the operation of hydrocele; he declaimed against the great number of complicated and superfluous instruments, and he expressed of Heister the wish that he had used his influence for the reform of useless instruments. He made a mistake in defending so earnestly the tamponade of the arteries instead of the ligature. The field-hospitals owed to him many improvements, especially the introduction of his system of ventilation, which has already been described in chapter four.

At an advanced age after having joined in every campaign for thirty-four years, Theden began to write. He began in 1771 with the first part of his "New Notes and Experiences for the Enrichment of Surgical Science," but acknowledged later, just as Schmucker had done, that on account of pressing duties which only permitted him to write at night, this book was too hastily prepared and not sufficiently elucidated. "While I was never a writer and usually feared to allow the few things of mine to appear, . . . nevertheless this book brought me more honor than I myself could hope for, in proportion to my experience, scientific education and culture." In this volume are chapters on the envelopment of the extremities, arquebusade-water, tamponade of the arteries, douche for ankylosis, gunshot wounds, cold applications in strangulated hernia, superfluous instruments, among which in most cases Theden counted scissors, which were said to cause a bruised wound and therefore more inflammation and pain than the bistoury, etc. The second volume appeared in 1782 and contained articles on hyrdocele, trepanation, exfoliation of the bones, aneurysms, concussions, tincture of antimony, various fractures, etc. In the third volume (1795) were essays on sublimate, intermittent fever, wounds of the joints, the opening of the bladder, the results of drinking cold water, electricity, castration, treatment of gunshot wounds, etc. In this he published for the first time the decoction for syphilis given him by the Saxon general-staff physician Zittmann (†1757). In 1774 the "Instructions for under-surgeons in the army" already mentioned appeared.

The other Prussian military physicians were of less importance than these three surgeon-generals. *Voitus* (1745–1787), the son of a schoolmaster, had through zealous diligence raised himself from poverty. At the close of the Seven Years' War he went to Berlin as company surgeon, where he shared with some poor artisans a little room which scarcely allowed him to stand upright, and subsisted almost entirely on herrings and potatoes. Schmucker accepted him as a pensioner, then promoted him to regimental surgeon. Frederick II. sent him to France in order to learn new operations, especially that of the rectal fistula. In Paris he also studied obstetrics. In 1779, after Henckel's death, he became professor of surgery in the Colleg. Med. Chir., chief surgeon in the Charité, and later third surgeon-general. Except two addresses on the acquirements and qualifications of a good surgeon, he published nothing, but was a popular teacher and obstetrician. His successor as professor, surgeon in the Charité and surgeon-general was *Mursinna* (1744–1823). The son of a cloth-maker, and at first destined for that trade, he entered a barber shop in his 13th year and served in Prussian and Russian field-hospitals till Theden made him hospital surgeon. When he saw the institutions of Berlin he vowed "not to rest until he himself became a professor." After peace was restored the want of money drove him again to the barber shop until he was made a company surgeon, and in 1887 was promoted to be third surgeon-general. When he had taken part in the war from 1790 to 1807, but was mustered out at the disbanding of the army, he devoted himself to the profession of teaching, having previously been appointed first professor of surgery in the Collegium Medico-Chirurgicum, and chief surgeon and first obstetrician in the Charité. In his "Medico-Chirurgical Observations," (2 Vols. 1782; "New Observations" 1796), which followed works on dysentery and obstetrics, one meets things which allow Mursinna's veracity to appear somewhat questionable. For example, he asserts, among other things, that within forty years he performed 908 extractions of cataract. *Görcke* (1750-1822) was a man of pre-eminent administrative ability; he likewise began as a company surgeon and became, after Theden's death, general-staff physician and chief of the military medical department of Prussia. Extensive travels had made him familiar with the medical writings, hospital management and educational institutions at home and abroad, the advantages of which he sought to bestow upon his fatherland. During the Rhine campaign he introduced movable field-hospitals, improved the service in them and founded the Pépinière. Upon his suggestion in 1795 were first introduced into the Prussian hospitals, ambulances which rested upon springs, after he had bought such a one in Rinteln, which the English army had left behind them on their departure from Holland, at a cost of 250 thalers apiece. Twelve such wagons were built at Potsdam after this pattern (each of which would carry six severely wounded men lying down and a number of slightly wounded who could sit up). In the year 1806 he had the hospitals under his direction, gave the company surgeons an increase of salary, appointed general physicians to the army-corps, founded a medical staff and secured a definite military rank for military physicians. It was also due to him that the first physician of a field-hospital became at the same time director of it. Upon his recommendation in the year 1811, a medico-surgical academy for the army was erected in place of the Collegium Medico-Chirurgicum abolished in 1809 at the founding of the Berlin University. One of his chief services was to have the system of the distribution of patients formulated and established. These various improvements were tested during the war for freedom, where chiefly his name and his personality served the necessary medical force. He was the regenerator of the Prussian sanitary system of the army.

Among the other regimental surgeons there were a few who were urged by Bilguer and Schmucker to literary work, although as a rule nothing more than a simple record of cases without any scientific value was produced from that source. Bilguer's "Surgical Observations" and Schmucker's "Miscellaneous Essays," as well as the periodicals of Loder, Hufeland, Mursinna and Arnemann comprised these productions. One of the most talented of the regimental surgeons was *Jasser*, whose name is remembered in our own time

through a sulphur salve for scabies. To be sure he was not the originator of this, for as early as the year 1667 a Prussian court physician Balthasar Timaeus à Guldenklee ("Cas. Med." Leipsic, p. 277) had used such a salve for scabies; but it had been forgotten. Jasser received the ointment in 1778 during the war from his landlady whose dead husband had cured many soldiers with it, and he treated 260 cases of scabies with it; Schmucker and Theden followed his method. Besides this he was the first in Germany to perform a trepanation of the pr. mastoideus, and he published an account of the treatment of a liver wound, in which he had successfully bound up a piece fallen forward and strangulated; likewise an injury of the larynx and esophagus. His colleague *Ollenroth* described a successful tapping of the breast with inhalations of warm vapor, a pericardial wound and a second lithotomy upon the same patient; he also invented out of sixty-one smooth tin balls and a sponge an instrument still in existence, for extracting foreign bodies from the esophagus. He recommended the mixture of cold water and milk in nephritis, cold application in strangulated hernia, etc. *Seeliger* recounts the healing of a shattered arm which hung by only a small strip containing the nerves and arteries. *Jung* cured a hand cut almost entirely in twain. *Morgenstern* published an account of a case of inflammation of the arm with thrombosis of the arteries. *Rudiger* told of a luxation of the spinal column and a gunshot injury of the neck. *Buddeus* wrote of the uses of amputation in exhaustion. *Horn* recommended cold applications in wounds of the joints, and objected strenuously to the bleeding of exhausted soldiers. *Cramer* cured an aneurysm by compression, while he laid a long compress upon the course of the arteries and enveloped the entire arm. These observations are all in Schmucker's "Miscellaneous Essays." The medico-surgical writings of *Hemmann* are said to have been declared fabrications by the author upon his death bed.

The medical writers in the army were extraordinarily rare, because too few educated physicians were in the field; therefore very little is known of the diseases in the Seven Years' War. *Baldinger* was a noted exception, who had taken part in this war and wrote on the "Diseases of an Army" (1765). He was later professor of medicine in Jena, Göttingen and Marburg. More of a scholar than practitioner was Professor *Ackermann* in Altdorf, who published a "Manual of the Medical Science of War" (2 Vols. 1795), and another on "Medical and Surgical Science in Armies" (2 Vols. 1797).

We now turn to *Austria* and at first find there the same crude conditions as those in Prussia. There, also, the under-physicians were wholly ignorant. Escaped from the barber shop they knew nothing of surgery, nothing of internal medicine, and could do scarcely more than nurses. One may glance at the primitive directions which van Swieten, who indeed had never been in the field, soon after the beginning of the Seven Years' War, laid down in a manual on "The Treatment of Diseases Prevalent in the Army," in order to gain an idea of the low plane of education of the military physicians. In this work is explained the absurdity in Austria (just as in Prussia) of the bleeding, without discrimination, of wearied soldiers upon the march. This custom was so general that even the officers in the spring and fall ordered bleeding and purgatives for the whole company. Thus more soldiers perished by the lancet than by the lance! Naturally, no good surgeon would serve in Austria for a monthly salary of from six to ten guilders. Indeed, they forbade the boxing of ears in the army, cashiered every officer and reduced the under-officers, and sentenced them to run the gauntlet six times through three hundred men, if they kicked a soldier or struck him. But about the same time (1769) they gave the staff-officer the right to address the regimental surgeon as "*Er*," and in the review, when everyone was allotted his rank, placed him behind the last cadet. For the want of good surgeons Maria Theresa had French surgeons brought, but they were for the most part unskilled, ignorant of the language and customs of the country, and did more harm than good in the army. The religious intolerance brought it about that all the protestant field physicians were taken out of the army, in the beginning of the Seven Years' War, if they would not be converted. Joseph II. had first to convince himself of the misery of the wounded soldiers and the small number of capable surgeons, in order to institute a thorough-going reform by the founding of Joseph's Academy. He said at the end of his life, that "whatever could be devised for the cure of sick and wounded men, or for their relief and maintenance, had never been neglected by him, and every man had been precious to him." He gave his staff and regimental surgeons, who had to be doctors, permission to treat civilians externally and internally, and he gave the under-surgeons the rights of their burgher colleagues; he increased the salaries in order to immediately abolish the abuse of the field surgeons accepting presents for visiting the recruits, and he pensioned the widows of field surgeons.

When Prussia in 1787 came forward with a new regulation, the Austrian emperor within a year thereafter had the sanitary system of the army reorganized by Brambilla. First of all, the Austrian military physician was to present himself in his uniform. At first he wore that of the regiment in which he served; in that way many annoyances arose, so that they devised a special dress. The coat was white and dark blue mixed, lined with red sleeves faced with black velvet, the waistcoat and breeches of red cloth. At each side of his face hung a single curl; behind, the hair was plaited with a black ribbon. Buttons, sword, and tassel on the black hat were gilded; the amount of gold increased with the rank until the surgeon-general was quite overloaded with it. This so-called proto-surgeon, at the same time court counsellor and court surgeon to the Emperor, director of Joseph's Academy, and inspector-general of all the military hospitals, was war counsellor only at the court; in the field, however, he was subordinate to the commanding general of the army. Under him were the professors of the Academy, then successively, the staff, regimental, battalion and under-surgeon, which last had the rank of a sergeant. While on the one hand Joseph II. sought to elevate their station, and commanded the regimental surgeons to address their subordinates as "*Sie*, because they were scientific men," he forbade them to write complimentary letters to their superiors at New Years and other festivals, yet on the other hand restricted them. For example, no one could publish a scientific work without having first submitted it to the proto-surgeon and received his permission. It is asserted that in the nineties, the Austrian field-physicians were threatened with arrest

if they did not treat the patients according to the Brown system. Their salaries were as follows:

	In Peace.	In War.
Proto surgeon	3,000 guilders.	Besides the salary, rations for six horses and four bread rations with the field quota.
Staff surgeon	600 guilders and free quarters.	1,200 guilders, rations for four horses and four bread rations.
Regimental surgeon.	600 guilders.	. . . . .
Battalion surgeon . .	240 guilders.	. . . . .
Under-surgeon . . .	168 guilders and quarters.	180 guilders.

The pensions for staff-surgeons amounted to 400 guilders; for battalion surgeons 100 guilders; if a regimental surgeon wished to marry he must give security to the amount of 1500 guilders. When vacancies occurred the commander had the right to make suggestions to the proto-surgeon. While the soldiers were treated gratuitously, the higher officers had to pay if they became sick through debauchery and intemperate living.

On the breaking out of war the proto-surgeon appointed the staff-surgeons to the army and to the hospitals; he himself remained with the main army, together with two commanding staff-surgeons for the the right and left wings. Each company received its under-surgeons. The army corps were provided with instruments and medicine chests out of the magazine in Joseph's Academy. Each regiment received two chests, which were packed upon mules or horses; they also received sufficient bandaging material and instruments, which were carried in the knapsacks. During a battle the proto-surgeon was stationed in the rear with the staff-surgeons, where a flag indicated the place for bandaging. The transient hospitals were located in the adjacent villages. All the military physicians were expressly ordered to "care for the wounded officers first and then for the other men, friend or foe, with the same zeal." The shattered limbs were placed in splints, or if these were lacking, they were wrapped with the shirts of the wounded. The staff-surgeon was to take care that limbs were not amputated unnecessarily. It appeared to be the custom, especially among the Austrians, when wounded, to wish for an amputation of their limbs in order to obtain a pension. Accordingly, in the hospital at Streigau, in 1745, Theden was obliged to make an extraordinarily large number of amputations at the solicitation of the imprisoned Austrian generals. Those who were severely wounded were transported to the chief hospital in wagons, with a physician accompanying them. For this purpose churches, castles, large buildings or barracks were appropriated. The wounded among our own men were separated from those of the enemy, and those needing medical treatment from those needing surgical attendance. The chief hospital was under the supervision of staff-surgeons, of whom each one looked after four hundred patients, bandaged the worst cases twice a day with his own hands, performed the important operations and reported every two months to the proto-surgeon. From 100 to 150 sick or wounded were allotted to each over-surgeon with four under-surgeons; but these were changed every one or two months from the inner to the outer stations. If they did not behave themselves the staff-surgeon had the right to put them under arrest for a few days. Soldiers, for the most part those who were awkward in drill or very disagreeable to their comrades, served as attendants. Under strict diet the food was divided into one-fourth, one-half, three-fourths and full portions. The strict diet consisted of a meat soup, sometimes made stronger by the yolk of an egg, and was given several times a day, and also at night to the severe cases. A full portion for a convalescent consisted of soup, five ounces of boiled beef without bones, vegetables, bread, and a pint of wine or beer. Experience in the Seven Years' War had taught that in consequence of the narrow quarters and bad ventilation, typhoid fever and scurvy wrought almost as great havoc in the royal army as did the bullets of the enemy. They insisted strenuously therefore on fresh air in the hospitals, and even went to the extreme of having three air-passages in the wards; an upper one for the fresh air, a middle and lower one to carry off the foul air. The beds, of which each patient had his own, were provided with a black tablet and number, and placed far enough apart that a table would fit between them. Instead of a chimney, openings were made in the windows, and Theden's ventilators were used in the wards, while fumigation was discountenanced. In summer, in good weather, the doors and windows remained open the whole day; in winter they were closed, but fresh air was admitted through the ventilators, morning and evening, after the bandaging had been done. Tobacco smoking in the wards was strictly forbidden.

Among the Austrian military physicians scarcely one deserves to be mentioned. Aside from Brambilla and a few professors in Joseph's Academy, who have already been mentioned, there is left to introduce only the field staff-physician Louvrier, who with Mursinna wrote a prize essay of that academy on "The Indications of Trepanning" (1800) and re-introduced the inunction cure for syphilis.

There is little to relate of the rest of Germany. Scientific aspirations were felt in Hanover earlier than in other states, for there King George I. of England, for the sake of advancing surgery, provided a course of instruction for his German troops. It was conducted by the court field-physician Wolf, court and general-staff surgeon J. E. Wreden, and general hospital surgeon Kannengiesser, and served to unite the Hanoverian regimental surgeons, of whom some had studied anatomy and surgery in Paris at the expense of the state; it also moved them in 1721 to undertake a yearly publication of their most important observations. *Wreden* published this collection in 1722-23, as "Collect. chir." *Evers* later came to the front among the Hanoverians; he had studied in Berlin and after the Seven Years' War had lived in Paris and Rouen, where he had dwelled with le Cat several months in order to learn lithotomy. He devised a bandage for the cure of the severed extensors of the finger and also for the transverse fracture of the patella, and described a cure of fistula of the anus without operation. (Neue vollst. Bemerk. und Erfahr. 1787; and several papers in Richter's Bibliothek.) It has already been mentioned that a Collegium Med. Chir. for the better training of army surgeons in *Saxony* was erected in Dresden under Pitschel (1748). In *Würtemberg*, Duke Charles added a medical faculty to his military academy (Carlsschule) when he removed it to Stuttgart in 1775. Among the seven students who first reported to that school was Schiller. Toilets were made, dinner eaten, prayers said, lectures heard, and retiring at night, all were done by order. At dinner the

students filed off in two columns, the nobles to the right and the commoners to the left, into the dining room. They fronted about to the table and upon a signal all folded their hands in prayer. That nothing could be accomplished by this drumstick discipline needs no demonstration. *Bavaria*, in the year 1802, first inaugerated a reform in its army sanitation, and from that time on no one was promoted to regimental surgeon who had not graduated from the gymnasium and studied the whole of surgery so as to combine in himself physician and surgeon.

(*To be continued.*)

SOCIETY PROCEEDINGS.

American Association of Obstetricians and Gynecologists.

Proceedings of the Tenth Annual Meeting, held at Niagara Falls, N. Y., Aug. 17-20, 1897.

(*Concluded from page 441.*)

SECOND DAY—MORNING SESSION.

POST-CLIMACTERIC CONDITIONS THAT SIMULATE ADVANCED UTERINE CANCER.

A paper on this subject was read by Dr. M. ROSENWASSER of Cleveland, Ohio. The writer commends the teaching that irregular hemorrhages and sero-sanguineous discharges, whether occurring during the parturient stage or long after the menopause, are good and sufficient reasons to suspect malignancy. We carefully watch for early symptoms and by their detection occasionally succeed in removing the disease while it is still local. On the other hand, we sometimes are caught off our guard when confronted by post-climacteric cases presenting all the classic characteristics of advanced malignant disease. Without the same circumspection exercised in the early stages we thoughtlessly pronounce the case beyond remedy or hope, specifying even the extreme possibility of life. The text-books are deficient in not sounding a note of warning against possible errors in the late stages. The so-called classic symptoms may be due to other (not malignant) conditions of the genital tract. Owing to effacement of the vaginal portion of the cervix in old age the differential diagnosis is in most cases limited to corporeal diseases of the uterus. Before the diagnosis of corporeal cancer can be made other diseases must be excluded.

The conditions which are likely to simulate advanced cancer are the following: 1. Senile vaginitis. 2. Foreign bodies in the vagina. 3. Gangrenous fibroids. 4. Atrophic, senile or post-climacteric endometritis. 5. Post-climacteric pyometra.

Of these conditions the last is especially liable to lead to errors. The writer gave the details of a case of pyometra occurring recently in his own experience and submitted abstracts of five more or less similar instances found scattered in the literature of the past seven years. In all these cases either a positive or provisional diagnosis of corporeal cancer had been made.

In conclusion, the author called attention to the singular fact that in the presence of the essential conditions—age, low vitality, cicatricial tissue, adhesions, chronic inflammation and irritating discharges—cases of transformation into malignant disease are either unknown or exceedingly rare.

(The afternoon was devoted to sight-seeing.)

EVENING SESSION.

Dr. RICHARD DOUGLAS of Nashville, Tenn., followed with a contribution on

CERTAIN CYSTS OF THE ABDOMINAL WALL,

in which he confined himself to a consideration of abnormalities of the urachus, and reported an interesting case of urachal cyst which occurred in a woman 36 years of age, married eleven years and sterile.

CONSERVATION OF THE OVARY.

A paper on this subject was read by Dr. B. SHERWOOD-DUNN of Los Angeles, Cal. The author said that Brown-Sequard believed and taught as a principle of physiology that every gland, whether or not provided with excretive ducts, gives to the blood a certain useful principle, the absence of which is felt and made apparent after their extirpation, or the destruction or modification of their functional activity by disease. The recent publication of researches made by Mond and Chrobak of Vienna, Jayle and Lissac of Paris, Mainzer of Berlin and Muret of Lauzanne, had given definite form to certain ideas that the speaker had conceived upon this subject, born of a series of observations taken in his hospital service in Paris of a variety of troubles and functional disturbances which more or less constantly follow as a result of double oöphorectomy. These various troubles and functional derangements, which are constant although variable in degree in women who have had the menopause anticipated by castration, form to his mind one of the strongest arguments in support of the glandular theory.

From observations made upon 100 cases operated upon in Broca and St. Louis Hospitals in Paris he found that where the woman had prematurely lost both ovaries 78 per cent. subsequently suffered a notable loss of memory; 60 per cent. were troubled with flashes of heat and vertigo; 50 per cent. confessed to a change in their character, having become more irritable, less patient, and some of them so changed as to give way to violent and irresponsible fits of temper; 42 per cent. suffered more or less from mental depression and 10 per cent. were so depressed as to verge upon melancholia. In 75 per cent. there was a diminution in sexual desire and some of these claimed they experienced no sexual pleasure; 13 per cent. were not relieved of the pain from which they suffered; 35 per cent. increased in weight and some became abnormally fat. Some complained of a diminution in the power of vision; 12 per cent. noted a change in the tone of their voice to a heavier, more masculine quality. Some 15 per cent. suffered from irregular attacks of minor skin affection; 25 per cent. had severe headaches, as a rule increased in intensity at the menstrual period. Equally as many complained of nightmare, more or less constant, while about 5 per cent. suffered from insomnia. In a few cases there existed a sexual hyperexcitability not present prior to the castration. He particularly noted a few cases presenting gastric reflexes where without any premonitory symptoms or apparent cause the stomach would reject food or refuse to prepare it for intestinal digestion and the consequent distress following the fermentation compelled the patient to seek relief. It should be noted that usually these troubles were more marked in women under 30 or 33 years of age.

He had been favorably disposed to the hypothesis advanced by Brown-Sequard for some time and any skepticism that he may have entertained of the theory of ovarian secretion and its usefulness and necessity to the equipoise of the whole system has been completely dissipated by the results of experiments made with ovarian substance, or ovarin, in patients who have lost both ovaries or were suffering from troubles which in a greater or less measure were due to a diseased condition of the ovary. In the observations of the authorities mentioned use was made of: 1. The ovary in its natural state. 2. The desiccated and powdered organ. 3. Glycerin extract of the ovary. 4. Liquid ovarin. The first form presents two objections, viz., difficulty of obtaining the fresh organ and greater difficulty in getting the patient to take it. The second form of powder has been the one most favored by all and has given as good results as the administration of the hashed fresh ovary or of the glycerin extract or the hypodermic injection of liquid ovarin prepared after the method of Brown-Sequard and preserved in sealed tubes. The essayist has so far used only the powder and the tablets, the latter in only one case, which did not respond as quickly as the others and he soon changed to the powder. But he would not say that one is better than the other as he had not given the tablets a fair trial, neither could he expect such good fortune as that the good effects observed in his three cases will continue in those that follow. The author closed with the report of three interesting cases.

SOME OBSERVATIONS UPON VENTRAL FIXATION.

By Dr. HERMAN E. HAYD of Buffalo.

In this paper it was stated that ventral fixation, or suspension of the uterus, coupled with the various plastic operations upon the cervix and vagina is the only means surgically or anatomically which will fix and support for future comfort and well-being an extremely prolapsed uterus. However, because a uterus sometimes offers a serious impediment to delivery by interfering with the proper dilatation of the organ is no reason why the operation should be relegated to oblivion. *Per contra*, it should be employed to relieve that large class of suffering women who have passed beyond the child-bearing period and who most frequently are the victims of extreme procidentia uteri. In his last six cases of ventral fixation he sewed the uterus to the abdominal wall with chromocized catgut (No. 3) and did not even scarify the peritoneal covering of the uterus. He held the organ by thin sutures, which took in simply the peritoneum and the connective tissue over it; but in one case where the organ was very heavy and the woman short and stout he hitched on to the rectal fascia and muscles. He has

invariably sewed the anterior surface of the uterus, feeling more satisfied with the position assumed under these circumstances than where the sutures catch the superior and posterior surface as is advocated in ventral suspension. In the cases he has operated on and those he has examined after operation of ventral suspension he has found the organ in a too anteflected position and it may be the cause of some future annoyance. He has discarded silk and all unabsorbable ligature materials, believing that catgut can be sterilized and rendered absolutely safe and is perfectly manageable.

Dr. JAMES F. W. ROSS of Toronto delivered the President's Address. He selected for his subject

SURGERY AND FACTS.

He said the work of the Association was confined between the diaphragm, the perineum and the abdominal walls and that the members had met to cultivate and promote a knowledge of whatever relates to abdominal surgery, obstetrics and gynecology. Attention was drawn to some unsettled questions, the first being peritonitis. Are we able to do more to save the lives of patients suffering from this disease in its acute form than we were ten years ago? Are we not but little better off with all our antiseptic and aseptic washes, gauze and tube drains and purgatives? He was satisfied that surgery could carry us no further when battling with this disease. The question of operating upon the appendix and the diagnosis and treatment of ectopic gestation had been fairly well settled. The method of dealing with the pedicle in ovariotomy had been settled, except for the fact that some operators preferred silk, while others were assured of the safety of catgut. Operations upon the gall bladder and gall ducts had been performed many times during the past ten years and they were now well recognized as proper surgical procedures. The operations of nephrectomy and nephrotomy were looked upon as everyday procedures justified by the consensus of surgical opinion. Abdominal hysterectomy was an operation that had been much improved and simplified, some operators being still wedded to the clamp, while others preferred some of the other methods. The advisability of oöphorectomy for some fibroids could not be doubted. There were two operations performed that Dr. Ross thought are of doubtful value, viz., the fastening of the kidney to the side and the fastening of a uterus anywhere. He considers that these operations have been recklessly performed and unnecessarily done. Another class of operations to which more thought must be given were those for intra abdominal and intrapelvic cancer. When peritoneal cancer has been diagnosticated, surely exploratory operation is uncalled for. Operations for other forms of cancer are of questionable utility. Take, for instance, resection of a cancerous intestine, gastro-enterostomy for pyloric cancer and removal of the uterus for uterine cancer. Gastro-enterostomy and resection of the intestine are poor makeshifts. For carcinoma uteri vaginal hysterectomy is the only operation that should be contemplated, but at best it prolongs life for but a short time.

Dr. C. C. FREDERICK of Buffalo, N. Y., read a paper entitled

WHICH IS THE PREFERABLE OPERATIVE METHOD OF HOLDING THE UTERUS IN POSITION?

All retroversions do not produce symptoms, but a certain proportion are accompanied by hypertrophy of the uterus, endometritis, leucorrhea, pain, backache, menorrhagia, metrorrhagia or general malaise. Constitutional treatment fails to relieve a large proportion of them without restoration of the uterus to a normal position and a cure of the accompanying hypertrophy and endometritis by reposition. The large factors in the continuance of the ill effect of retroversion are torsion of vessels, infection of the endometrium and defective drainage of the uterine cavity. Retroversion is a first stage of prolapse, and ought for that reason alone to be replaced and held in position. Sterility is one frequent result of retroversion. Results of treatment are good by operation or by holding the uterus in position by a pessary, if possible, together with general tonic treatment, Weir Mitchell rest treatment, etc. A large proportion of cases are cured and eventually get strong and well again. Ventrofixation has been discontinued by the writer in women liable to bear children. He uses it only to hold up the uterus in operation for prolapse and in those cases where he has removed both tubes and desires to hold the uterus in position, time being an element in the operation. The writer has seen no ill results during labor and knows of none occurring in his own cases, although several have borne children. He has seen no recurrence of retroversion, even in those who have borne children. His preference is given to the Alexander operation or some of its modifications in cases of women who have borne children and there are no adhesions or diseases of the adnexa. Women who have never been pregnant are liable to have poorly developed round ligaments, liable to tear away from the anchoring sutures. In these he opens the abdomen and shortens the round ligaments by one of the methods devised by Mann, Dudley or Wylie. He gives Mann's method the preference. Several of the patients have borne children both after the internal and external shortening of the round ligaments, with good results. The writer now uses unabsorbable ligatures or sutures, always using plain catgut or chromicized catgut when a suture is used for a long period. He never has used any of the vaginal methods of fixation, not being pleased with them.

The uterus will now appear as far forward in either of the methods of shortening the round ligaments as it is in normal anteversion, but the pressure upon the posterior surface of the uterus will force the body into extreme anteversion, and in a few months will appear perfectly normal in position.

THIRD DAY—MORNING SESSION.

THE TECHNIQUE OF THE DRY METHOD

was the title of a paper by Dr. EDWIN WALKER of Evansville, Ind., in which he said that by the dry method is meant a technique in which no water or other fluid is used. This does not apply to the preparation before the operation. After the first stroke of the knife until the wound is closed, not a drop of water is used. The writer has employed it exclusively for several years with good results. The technique is as follows: Nurses are instructed to use every precaution to prevent soiling the hands in septic cases and to thoroughly disinfect the hands after any suspicion of contamination. Every instrument used is sterilized before it is put away. The hands are scrubbed thoroughly with a brush, with liquid soap (equal parts of green soap, glycerin and alcohol), and repeatedly rinsed in sterile water. They are then wiped off with alcohol, dipped for two minutes in bichlorid solution, 1 to 1000, and then washed off with salt solution. The field of operation is similarly prepared, except that the scrubbing is repeated daily for two or three days before the operation, and a soap poultice used at night. The instruments are boiled in soda solution for five to ten minutes, wrapped in towels or placed in metal boxes, which are opened only at the time of operation. Plain gauze is used for every purpose except packing the uterus, and in rare instances where drainage is used iodoform gauze is preferred. The silk ligatures are wrapped on spools and placed in glass boxes, and the silkworm gut and silver wire in long glass tubes and all sterilized by steam, as are the dressings. The plain catgut is boiled in alcohol and the chromicized is prepared after Edebohl's method. After the patient is placed on the table the dressing, which consists usually of plain gauze, is removed from the field of operation, and sterilized towels adjusted as usual. The instruments are unwrapped, and everything is in readiness. The sponges are used dry and thrown away when soiled. The flat sponges in the abdomen are also used dry, and are provided with a cord which is clamped with a pincette. The latter is left outside, so that the sponge can not be forgotten and left in the abdomen. The author has not had extensive experience in puerperal sepsis or general septic peritonitis, but would be inclined to use it in both these conditions, for it has proven satisfactory in sepsis following abortions and localized collections of pus in the abdomen.

SURGICAL SHOCK AND HEMORRHAGE, WITH REFERENCE TO PREVENTION AND TREATMENT.

This paper was read by Dr. WALTER B. CHASE of Brooklyn, N. Y., in which the author presented the following summary:

1. The treatment of shock should be preventive and curative, and to a large degree the indications for the former define the lines of treatment in the latter.

2. The proper exhibition of preventive measures includes a careful study of the functional activity and organic status of all important organs, and such treatment by hygienic, dietetic and therapeutic measures as will elevate the standard of bodily and mental health to a degree in which the maximum power of resistance may be produced and maintained.

3. Special emphasis should be given to lithemic and uremic excretion, and to the condition of the circulatory and nervous systems.

4. Knowledge as to inherited power of resistance to, and recovery from, serious disease and accidents, are of the highest value in determining the course of procedure and in estimating the chances for recovery after capital operations.

5. A supply of facilities and drugs for meeting all emergencies should be in constant readiness, with exact knowledge for the indications, dosage, physiologic and therapeutic effect of special heart tonics and stimulants, including strychnia, digitalis, nitroglycerin, etc.

6. Limit the time of an operation to the shortest space compatible with thorough work and proper technique.

7. Save the patient from the shock of fear to the utmost, and in selected cases proceed to operation without informing the patient of your purpose.

8. In shock with hemorrhage supply the volume of venous and arterial loss by direct transfusion of normal salt solution into the patient's veins.

9. Bear in mind the influence position has on the circulation under both shock and hemorrhage, especially in anemic conditions of the cerebrospinal nerve-centers and the heart.

Dr. W. H. WENNING of Cincinnati, Ohio, read a paper on

PLACENTA PREVIA WITH SPECIAL REFERENCE TO TREATMENT.

The following is a summary of the treatment laid down by the author in the order of time of the accident, amount of hemorrhage, and condition of the patient:

a. Before labor.—1. Hemorrhage slight, rest, expectant treatment. 2. Hemorrhage moderate; tampon vagina. 3. Hemorrhage profuse; also try tampon and induce labor.

b. In the beginning of labor.—1. Hemorrhage moderate; Braxton Hicks' method, provided the obstetrician has skilled assistance at hand, otherwise tampon the cervix with the cervical bag, until *c, labor is well in progress*, then rupture membranes and deliver by podalic version, or if hemorrhage is arrested by the descending head, deliver by forceps or permit spontaneous expulsion, if pains are good.

At any stage, when hemorrhage is excessive or can not otherwise be arrested, manual dilatation, followed by *accouchement forcé.*

The tampon is *indicated:* 1. In hemorrhage toward the end of pregnancy. 2. In the beginning of labor when the os is closed. 3. In moderate dilatation of the cervix—then use cervical tampon. *Contra-indicated:* 1. When dilatation is complete or nearly so. 2. When it fails to arrest hemorrhage even when dilatation is not far advanced.

Rupture of the membranes is *indicated:* 1. When the os is well dilated and either spontaneous labor or artificial delivery may occur. 2. When by this method hemorrhage is better controlled than by other means. 3. When in the absence of labor pains it will be followed by immediate pressure of the presenting part. *Contraindicated:* 1. When os is undilated and pains good. 2. In faulty presentation of the fetus unless it can be followed immediately by version.

Version is *indicated:* 1. When the os will admit two fingers and combined version can be readily made—Braxton Hicks' method. 2. When the os is well dilated or dilatable and hemorrhage is profuse, direct or internal version. 3. In desperate cases, *accouchement forcé. Contraindicated:* 1. When with a moderately dilated os combined version can not be skilfully made (the cervical tampon). 2. When with a well dilated os after rupture of the membranes the head immediately engages in the cervix.

In all cases strict supervision from the onset of labor to the end of delivery.

A paper entitled

COMPLETE HYSTERECTOMY AFTER INJURY DURING PARTURITION AND CÆSAREAN SECTION WITH REPORT OF CASES

was read by Dr. JOSEPH H. BRANHAM of Baltimore.

The first patient was 24 years of age, female, married, and had been pregnant for the third time. As the pelvic contracture was so marked there was no hope of a living child being born naturally; the child was delivered by Cæsarean section. The patient lost considerable blood per vaginam after the operation and rapidly developed symptoms of septic infection. She died two days and a half after the operation. The question arose as to whether Cæsarean section or symphysiotomy was the better procedure. The essayist thinks the latter would have given the best chances for recovery, but as infection had already taken place, in all probability the final result would have been the same, and even craniotomy under the circumstances would likely have proved fatal.

The second case was one of rupture of the uterus. The mortality of this condition was said to be 80 per cent. The accident may occur at any time from the third month of gestation until the termination of pregancy. The causes and prominent symptoms of rupture of the uterus were detailed. *Treatment:*—When symptoms of uterine rupture occur, delivery should be completed as rapidly as possible by the use of whatever means may best bring about the results. The child nearly always dies in a few minutes, so that only the mother should be considered. If the child has escaped into the abdominal cavity immediate laparotomy is indicated. After the child had been delivered two methods of procedure are recommended by authority. One is the closing of the tear by packing with iodoform wicking and drainage of the parts with gauze. The other, which in complete ruptures is often more popular, is to do a laparotomy, cleansing the peritoneal cavity. In suitable cases close the tear by the Sänger method. If the tears are very extensive and there is a strong probability of uterine infection, a Porro operation or complete hysterectomy is the best method. The preventive method consists in the early relief of difficult labor by suitable operative interference, instituted before the uterus has become very thin and damaged by long continued pressure between the presenting part and the bones of the pelvis.

Dr. X. O. WERDER of Pittsburg, read a paper on

TONIC AND SPASMODIC INTESTINAL CONTRACTIONS WITH REPORT OF CASES,

in which he reviewed five cases, one by Dr. Murphy, two by Dr. Long, and two of his own, reported by Dr. Long at the Richmond, Va., meeting of the Association, and adds some additional cases of a similar condition that he has observed subsequently. He referred to cases reported by L. Heidenhain and applied the term enterospasm, dividing the cases according to their nature and severity into spasmodic and tonic or tetanic forms. He considers that they are perversions of normal peristalsis due to a reflex chemical irritation exerted at the seat of contraction (either on the mucous or serous surfaces of the bowel) or elsewhere in the alimentary canal or abdomen, and shows that they assume surgical importance when, in the spasmodic varieties they simulate neoplasms as in three cases of that variety reported; or when they cause obstruction to the fecal current, becoming true cases of dynamic ileus, as in the five cases above referred to. Regarding the accuracy of diagnosis in these cases there can be but little doubt. Dr. Long's cases had undoubted symptoms of intestinal obstruction that varied in intensity over quite a long period. Operation revealed firm contractions of bowel. Careful search failed to show any other cause for the symptoms. Dr. Murphy's case previously treated for several attacks of lead colic, operated on for intestinal obstruction of several days duration, nothing was found but firm contraction of bowel. It relaxed after exposure to air. Three hours later spontaneous bowel movements occurred. Dr. Werder's first case gave history of previous attacks following ingestion of articles of diet made of milk. Simple salpingo-oophorectomy for simple sarcoma. Clean case. Excellent condition for first six days. Onset of attack sudden and followed ingestion of egg-nogg by an hour or so. Symptoms of partial intestinal obstruction that later became complete, plus depressing defects of some toxic agents, were noted. Especial attention was called to two rational but misleading symptoms, namely, the occasional expulsion of gas for first three days (that is till patient was in collapse two days before death), and an abdomen that was soft, flat, and not tense or tender. Violent peristalsis persisted till death. Autopsy four hours later showed peritoneum everywhere glistening, normal. Pedicle covered by normal endothelium. No adhesion; no exudate; nothing abnormal could be found except firm contraction of lower 55 cm. of ileum and whole large intestine, and sacculation of section of bowel next above it. Cause of contraction attributed, as a probability, to tyro-toxicon absorption; death of patient, to intensified absorption of tyro-toxicon and other toxins forcibly retained in bowel. His second case followed vaginal hysterectomy for small fibroid. Symptoms of obstruction began earlier and were more pronounced than in the preceding case. Peristalsis persisted till death at the end of the fourth day. Autopsy two hours later showed sigmoid and ileum adherent to vaginal vault for an extent of three inches. All peritoneum visible from above was normal in appearance. No exudate. Bowel extending from seat of adhesion of ileum to valve, and from adhesion of sigmoid to anus, firmly contracted. Sacculated bowel above. Plastic lymph at seat of adhesions and at the parts exposed to vaginal gauze and clamps. Two c.c. of fluid found there. No pus visible to naked eye. No microscopic examination. Cause of contraction, chemical and mechanical irritation applied to serous surface; cause of death, possibility of mild sepsis combined with absorption of toxin from intestinal canal.

Of the spasmodic variety, the first case showed a sausage-shaped mass, three inches long and one inch thick at pylorus, with limited mobility, and mapped out at each examination by several careful observers—not present when under ether and abdomen cleansed. Abdomen opened, pylorus and duodenum delivered; looked and felt normal. On manipulation they contracted firmly and were as hard as a finger, but only to relax in two or three minutes. This was repeated several times in full view of all present. In second case, contraction found accidentally when doing a supensio-uteri. In third and fourth cases consulted for presence of tumor. Found firm contractions of bowel, near umbilicus, that resembled a neoplasm. They relaxed and contracted again several times during an examination that lasted fifteen or twenty minutes, always reappearing

at the same place. Condition recognized and operation advised against. These patients were all neurotic and complained of quivering and commotion at seat of trouble, as well as of dyspepsia and obstinate constipation.

DYNAMIC ILEUS FOLLOWING OPERATIONS INVOLVING THE ABDOMINAL CAVITY, WITH REMARKS ON ADYNAMIC ILEUS.

This paper was read by Dr. FREDERICK BLUME of Allegheny, Pa. The author said that considerable progress in the diagnosis and treatment of ileus following abdominal section was made when Olshausen in 1887 directed attention to an article read before the Berlin Obstetrical and Gynecological Society, to the form of intestinal obstruction which had not yet been recognized, viz., a paralysis of the gut not depending on septic peritonitis. The symptoms in these cases are increased, pulse rate normal, slightly elevated, or, in some cases, subnormal temperature and vomiting. Two or three days after the performance of the operation, or even later, symptoms of collapse manifest themselves, the pulse becomes rapid and feeble, the abdomen more and more distended and retching and vomiting more frequent. Neither gas nor feces are expelled from the rectum. Death ensues between the fourth and tenth day, and is the result of general systemic intoxication from absorption of the decomposed intestinal contents.

In a recent article Engström reviews the literature of the subject, and concludes that paralysis of the intestines can and does occur after operation involving the abdominal cavity without infection having taken place at the time of operation. Eventration and prolonged manipulation of the bowel are the most potent etiologic factors, causing irritation of the nerves of the mesentery and gut wall, and leading to changes in the circulation. From his own experience Engström is able to confirm the statement of other observers that a paresis of the intestinal wall can be produced by the administration of strong saline purgatives, and it appears to be by no means improbable that, as a consequence of their use, a weakened condition of the gut walls is produced prior to the operation. He looks upon the increased susceptibility of the nervous system, often so marked in patients about to undergo a surgical operation, as a predisposing etiologic factor.

The author said that the differential diagnosis between postoperative intestinal obstruction and dynamic ileus is practically impossible, but that in either case the only chance for the patient is afforded by early operative interference. The surgeon, however, must distinguish these forms of ileus and a very obstinate form of constipation so often met with and so difficult to overcome, after operations in the abdominal cavity. The occurrence of fecal vomiting is not always a pathognomonic sign of ileus, as this vomiting sometimes occurs in other conditions and when there exists no indication for surgical interference.

Dr. ALBERT GOLDSPOHN of Chicago contributed a paper on

THE FATE OF OVARIES IN CONNECTION WITH RETROVERSION AND RETROFLEXION OF THE UTERUS.

He drew the following conclusions: 1. In all cases of retroversion and retroflexion of the uterus a knowledge of the ovaries as to their location, mobility and general physical condition should comprise an essential part in the diagnosis, as determining largely the nature and urgency of the treatment. 2. The welfare of ovaries, in general, demands such a degree of anterior inclination of the longitudinal axis of the uterus as will enable intra-abdominal pressure to bear upon the posterior surface of the organ, and thereby to act in unison with its other supports to retain it and its adnexa in normal position and function. 3. Inasmuch as in the female pelvis, as well as elsewhere in the human body, the natural and considerable abilities of healthy tissues to defend themselves against microbic invasion (infection) are lowered or annulled in direct proportion to any degree of mechanical embarrassment of the venous circulation in the tissues or organs, it behooves gynecologists especially to be alert in recognizing and correcting all material anomalies in place or posture of the female generative organs or in securing to them their normal freedom.

Dr. WALTER B. DORSETT of St. Louis, Mo., read a paper entitled

THE ADMINISTRATION OF PHOSPHATE OF STRYCHNIA DURING GESTATION.

The following observations have been made by him in the use of this drug during the gestation of weak and debilitated patients: A good appetite and good assimilation are obtained in the general weakness and debility of the anemic. Constipation is relieved, the patient is built up and placed in a good condition to pass through the ordeal of labor. The uterus contracts promptly after the third stage of labor, and the use of ergot is entirely dispensed with. If he finds it necessary to use the forceps, the patient is given a hypodermic injection of 1-30 grain sulphate or phosphate of strychnia as soon as the anesthetic is commenced, but no ergot is ever used. After the continuous use of the phosphate of strychnia, the uterus contracts promptly after the second stage of labor, and in many cases the application of Crede's method of expression of the placenta is not needed to bring it away, and no postpartum hemorrhages have occurred. The frequently observed chilliness or rigors, which in the majority of cases follow labor, has been noticed in but few cases. He has used strychnia for some time in his abdominal surgery, for the purpose of preventing shock and to control the pulse in the operations, and in this way was led to its use in obstetrics. As phosphorus and strychnia are remedies used in the treatment of rachitis with good results, would it not be the remedy during the gestation of the rachitic fetus?

THIRD DAY—AFTERNOON SESSION.

This session was largely devoted to the exhibition of pathologic specimens, with histories and photographs of the same. Specimens were presented and the histories of cases related by Drs. Vander Veer, Dorsett, Macdonald, Ross, McMurtry, Smith, Hughes and others.

FOURTH DAY—MORNING SESSION.

Dr. GEO. S. PECK of Youngstown, Ohio, read a paper in which he reported

FIFTY-TWO CASES ILLUSTRATING HIS PERSONAL EXPERIENCE WITH THE MEDICAL AND SURGICAL TREATMENT OF APPENDICITIS.

He said there were four cardinal symptoms which will almost invariably insure a correct diagnosis, if they occur in the order given. 1. Sudden severe pain in the abdomen, generally of a colicky nature, located in any part or extending over the entire abdomen. 2. Always nausea and frequently vomiting. 3. Increased temperature. 4. Localized tenderness in the right iliac region. Some patients will have diarrhea, while others may be constipated. He had never failed to make a correct diagnosis when the four cardinal symptoms were present.

Treatment.—Surgeons differ in their methods of operating. Some advise in the acute suppurative form simple incision and evacuation of pus. If the appendix can not be easily found, it should be left, drained and packed, and then in the interval between attacks the appendix should be removed, always provided one can get the consent of the patient, which the speaker has found to be difficult. A few surgeons advise the liberation of all adhesions and the removal of the appendix in all cases of acute suppurative appendicitis and have reported good results. He believes it is the duty of every surgeon to make a complete operation in the vast majority of cases, and thinks that the time is not far distant when surgeons will advise the breaking up of all adhesions, the removal of every diseased appendix, and the closing of the incision as is now done in the operation for pyosalpinx, as advised by Morris, Price and McMurtry. In his last three cases he has followed this method and the results have been far beyond his expectations. Two of the cases were discharged in three, and one in four weeks.

Dr. LEWIS S. MCMURTRY of Louisville, Ky., followed with a paper entitled

THE OPERATION ITSELF IN APPENDICITIS.

He considered the subject under the following headings: 1. The incision. 2. Dealing with adhesions and with abscesses. 3. Removal of the appendix. 4. Drainage and isolation of the peritoneum by gauze.

Concerning the incision three important considerations must be observed: 1. To obtain easy access to the caput coli with sufficient working space. 2. To secure all natural advantages to facilitate drainage. 3. To do the least damage possible to the parietal structures incised in order that firm union may be secured and hernia thereby prevented. The early operations for appendicitis were mostly in extreme cases, wherein suppuration had obtained, and consisted in cutting down into an abscess and evacuating and draining the same. For this purpose the vertical incision was adopted and is yet practiced by many surgeons. This incision does not, however, give as easy access to the appendix and to the outer and posterior areas adjacent thereto, which are so frequently involved, as does the oblique incision. A method of dividing the abdominal wall by a combination of incision and blunt dissection has been described by McBurney and commended by many writers on the surgery of the appendix. This incision was described at length.

Dealing with adhesions and abscesses.—In dealing with adhesions and abscesses the same general rules of surgical treatment should be observed in appendicitis as in similar con-

ditions affecting other organs enclosed within the peritoneum. Whenever practicable, adhesions should be separated, abscesses emptied, disintegrated structures composing foci of infection removed, and cleansing and drainage secured by measures of assured efficiency.

Removal of the appendix.—In his early operations he ligated the appendix with the meso-appendix, using fine sterilized silk, cut away the appendix and applied pure carbolic acid to the stump. Later he adopted the modern method of transfixing the meso appendix at its base, cutting it away, stripping back a cuff of peritoneum from the appendix down to its junction with the cecum, ligating the appendix with fine silk and cutting it away, sterilizing the stump, invaginating the stump into the cecum and covering with peritoneum by careful stitching after the Lembert method. Nothing in the progress of healing or in ultimate results indicated any advantage of the latter method over the former simple ligature, excision and cauterization.

Finally, Dr. McMurtry discussed drainage and isolation of the peritoneum by gauze.

Dr. THOMAS J. MAXWELL of Keokuk, Iowa, contributed a paper on "Senile Irritable Uterus." In three cases he was unable to relieve this condition by tentative treatment, and finally resorted to hysterectomy with complete success in all of them.

The election of officers resulted as follows:

President, Dr. Charles A. L. Reed of Cincinnati, Ohio; *Vice-Presidents*, Dr. Richard Douglas, Nashville, Tenn. and Dr. Walter B. Dorsett, St. Louis, Mo. *Secretary*, Dr. Wm. Warren Potter of Buffalo, N. Y. *Treasurer*, Dr. X. O. Werder of Pittsburg, Pa. Place of meeting, Pittsburg, Pa., September 20, 21 and 22, 1898.

After introducing and adopting resolutions of thanks for courtesies extended, the Association adjourned.

SELECTIONS.

Centrilobular and Pericellular Cirrhosis.—Dr. J. E. Adami, in the *Montreal Medical Journal*, concludes a long article on cirrhosis with remarks regarding these two interesting phases of hepatic disease. The centrilobular form apparently only develops as a consequence of chronic heart or lung disease associated with passive congestion of the liver and the condition of nutmeg-liver. Passive congestion in general may lead to fibroid overgrowth originating around the veins, and it is around the central intralobular branches of the hepatic vein that such fibroid overgrowth may at times be recognized. While sundry French observers would ascribe one form of hypertrophic cirrhosis to this central development of fibrous tissue, it is difficult to agree with them. The liver of passive congestion may be larger than normal but congestion is not hypertrophy, and associated with any degree of centrilobular cirrhosis there is marked hypertrophy of the liver cells, while the amount of connective tissue laid down is relatively slight as compared with what may be developed in perilobular cirrhosis. It is unfortunate that this term, hypertrophy, has been introduced at all in connection with cirrhosis. This form also is incapable of being recognized clinically; it may be suspected in long-continued obstructive disease. It is in every respect one of the minor forms. Regarding pericellular or replacement cirrhosis, I would say, that while I am inclined to think that in portal cirrhosis there is primarily an overgrowth of connective tissue around the medium-sized branches of the portal veins and recognize a similar deposit occurring around the bile ducts, arteries and branches of the hepatic veins, there is another highly important deposition or development of new connective tissue in the liver which yet remains to be discussed, one which has up to the present received too little attention, although from to time high authorities such as Kelsch and Wannebrouck, Hamilton, Beale and Grandmaison have more or less called attention to it. Where isolated cells of a tissue or collections of cells atrophy and die there is in general an attempt to replace them, if not by cells of a similar nature, then by connective tissue, or, failing this, by fluid, (as in some cyst formations). A replacement fibrosis of this nature may be localized, as after scattered necroses through the liver substance. Such fibrosis very possibly explains in part the cirrhosis occurring in malaria, and in those infectious and septic diseases in which sporadic necroses of the liver are becoming more frequently recognized. Or on the other hand, it may be more generalized, affecting the periphery of the lobule or in some cases the whole lobule. In the Pictou cattle disease this could be seen in its various stages. Pictou cattle disease is a chronic infectious disease of cattle in Nova Scotia characterized especially by extensive cirrhosis of the liver. In early cases, as first pointed out by Dr. Wyatt Johnston, the liver cells show various evidences of degeneration, and this stage is followed by atrophy so extensive that in advanced cases all the cells of some lobules may become unrecognizable, their place being taken by a delicate connective tissue. In other regions, short columns of the atrophied cells may be isolated and surrounded by similar connective tissue, while, as in biliary cirrhosis, there may be very numerous imperfectly formed bile canals, examples of which have been termed "reversionary" degeneration of the liver cells. Along with this there is in general singularly little small-celled infiltration. The process is essentially one of hypertrophy of the liver cells by toxic agency followed by replacement fibrosis. It is interesting to note that in all cases where this pericellular cirrhosis is well marked the liver tends to be enlarged—hypertrophic—or if not enlarged is not found hobnailed. There appears to be a difference in the way in which the new connective tissue is laid down. Whereas in ordinary portal cirrhosis there is a frankly inflammatory infiltration of small round cells, followed by connective tissue growth, the new tissue is typically cicatricial, *i. e.*, with full development it contracts very markedly, and so produces the hobnailed condition. In such cases the atrophy of the liver cells is secondary and is in the main due to the presence of the fibrous bands. In the cases of extensive replacement cirrhosis above referred to, there is curiously little small-celled infiltration; a loose transparent connective tissue develops which evidently is not nearly so prone to contract. Degeneration and atrophy of the liver cells may be brought about in four ways: 1. By pressure. 2. By toxic substances reaching the cells by the circulation. 3. By toxic substances reaching them along the bile capillaries. 4. By arrest of function resulting from obstruction of the bile ducts. To the first of these we have already referred; the contraction causing the atrophy does away with the opportunity for a replacement fibrosis. About the third possible way we know little. It is unlikely that toxins should diffuse up the bile canals in a direction contrary to the flow of bile. With regard to bacteria penetrating the liver along the bile ducts and producing toxins we are in doubt. We know from the researches of Welch, Flexner and others, that pathogenic microbes are not infrequent in the gall bladder, and in the last two cases of hobnailed liver coming to the postmortem room of the Royal Victoria Hospital we were not a little surprised to gain cultures of the B. coli communis (the most common form to be found in the gall bladder) from the liver juice when other glandular organs did not show this form. But on the whole it is for the present to be regarded as unlikely that degeneration of the liver cells and cirrhosis are induced to any considerable extent by toxic agencies passing up the bile duct and capillaries. It would seem more probable that obstructed and perverted action of the liver cells by closure of the bile ducts, leads to their degeneration.

The Great Lessons Taught by Bacteriology.—Dr. Sims Woodhead, pathologist at the laboratory of the Royal College of Physicians, London, in a recent lecture reported in the London *Lancet*, seeks to correct certain false notions that have arisen regarding the life work of the bacteria. The tendency has been to accept them as the ultimate causes of certain forms of deadly disease and as promoting the evolution of putrefactive

products; whereas, as a matter of fact, they are instrumental in keeping the world sweet and clean for its inhabitants and in maintaining a constant circulation of organic matter from the dead condition to the living and from the living to the dead. It is interesting to reflect that without the aid of bacteria the human race would be unable to continue its existence, the animal and vegetable world would long since have perished from sheer inanition or starvation, and the work of the world as a great laboratory would have come to a standstill. Bacteria, as is being found out every day, may be engineered for man's good, so long as they are kept under intelligent control, and once their habits are understood they prove to be the most perfect servants that can be obtained. The lecturer proceeded to trace the history of bacteria and their discovery, and the developments up to the present time which have followed upon a close and exact study of their behavior. The functions of bacteria in the great natural processes in their bearing upon sanitation were then dwelt upon; and finally, the recent developments in regard to the wonderful ability of certain species of bacteria to appropriate the nitrogen in the air, through the medium of the soil, for the maintenance and the sustenance of leguminous plants, formed not the least interesting section of the lecture. It was remarked that so well defined were the results of the researches in this direction, that cultivations of these organisms are now made for sale and kept in closed bottles for distribution to all parts of the world. There, when mixed with water and thrown over the soil, they immediately begin to do their work, and taking nitrogen from the air, which lends valuable assistance to that from the soil, they enable the plants, and especially those requiring large quantities of nitrogen for their full growth and development, to grow both more rapidly and more luxuriantly than they could do if unaided by this supplementary store. The relation of bacteria to disease was next touched upon, and the beneficial effects of fresh air and light accounted for by observations on the inhibitory action of these agencies upon such organisms. Dr. Woodhead concluded his lecture with the following words: "As yet no one can say that we have reached even a resting stage, and it behooves all those who desire to see advances made in the treatment and prevention of disease—whether in the department of protection and cure, with which medicine is specially concerned, or in the preventive department, with which civil engineers have to deal—to continue to follow closely every new fact and every fresh theory arising out of new observations, in order that bacteria and the forces with which they are endowed may be made our well disciplined servants, instead of being allowed to waste their energies as our uncontrolled and uncontrollable masters."

The Practitioner's Economies in Time and Effort.—The physician who hopes to accomplish much, who has the ambition to do something more than routine medical work, who wishes to keep abreast of the times, must learn not only to seize the day but the hour and minute of leisure. The secret of accomplishing much consists in having convenient arrangements for utilizing the scraps of time between professional engagements and in being able to make light of drudgery. Convenience means the performance of many things; inconvenience, the neglect of necessary tasks. The average man will examine urine if his utensils are in or next to his office and if he has a sink into which to throw waste. If he must go up or down stairs for his examinations or to empty bottles, or if he must push aside writing materials to make room for his test tubes, he will avoid analysis of urine as much as possible and will fail in diagnosis in occasional cases. In writing, a typewriter will be found easier than a pen or pencil. Hour for hour, more can be written and with less fatigue in spite of the greater amount accomplished. A roomy and well arranged desk is a great time-saver. Have a drawer for each line of work that you happen to be engaged in, one for business, one for science, one for correspondence; set aside a space for every important undertaking that will occupy spare moments for more than a few days; in short, have your notes or letters, or whatever your material may be, so that you can pick them up and lay them aside at a moment's notice. Personal comfort is a great factor in increasing one's capacity for work; perhaps it should even be placed before convenient arrangement of materials. Spare your eyes, use a good lamp instead of gas and make sure of plenty of daylight, not too glaring. Place your furniture so that the light will not be in front of you. All things considered, your private office ought to be the best room in the house, for its purpose. Keep warm, avoid drafts, don't stifle for lack of ventilation in summer. If only one room in your house fulfils these demands, take it for the office. You can put up with imperfect hygiene in the parlor or even in the dining room, where you will spend only a small part of your time. Have an easy chair, well cushioned, and preferably one that you can adapt to the height of your desk. In general, make your office as pleasant, as convenient, as comfortable as possible. Use your brain to the best advantage and not too long on any one task. If your professional work for one day has been mostly in the open air, rest yourself by reading or writing, or chemic or microscopic study. If most of your patients have been office cases, and the day is pleasant, refresh yourself by attending to the numerous errands that are always in order. Tax your memory as little as possible with unnecessary details. Keep one of the memorandum blanks which are sent you as an advertisement early in the year, and whenever an engagement is made, jot it down under the proper date. As you pay your life insurance premium, or attend a meeting or deliver a lecture, or discharge any other recurring obligation, enter the next in your list. It will take but a moment to consult your memoranda each morning, and you will be free to forget engagements till the proper time and need not worry about the possibility of mistakes.—*American Therapist.*

PRACTICAL NOTES.

Objections to Use of Picric Acid.—Dr. Waldo (*Lancet*), commending upon the growing use of picric acid in eczema, thinks that "it may cause much prostration, and in fact all the symptoms of carboluria, with very dark urine. The unpleasant symptoms developed certainly resembled the action of carbolic acid."

Thread Worms.—Some of our exchanges recommend the formula of the *Journal de Médecine de Paris*: Three-fourths of a grain of santonin and one and a half grains of calomel by the mouth every day before breakfast for three days; also every evening for the same number of days insert within the sphincter a modicum of mercurial ointment one part and glycerite of starch, two parts.

Diabetes Among Locomotive Engineers.—The *Medical Press and Circular* refers to the increase of cases in this disease and especially to its marked mortality among the class mentioned. The causes cited are the jarring, the mental strain and the changes of temperature. "There is much yet concerning the pathology and etiology of diabetes which is obscure;" so concludes the article.

Tuberculin Test for Infants.—G. A. Alfaro of Buenos Ayres, urges the more general use of the tuberculin test in diagnosing the affections of infants and young children. It is absolutely harmless at the minimal dose and at intervals of a week or more, while the benefit derived from it is very great, as he demonstrates by several observations in the *Anales del Circulo Med. Argentino.*

The Meningeal Symptoms in Typhoid Fever, according to Dr. Kuehnau (*Berliner klin. Wochenschrift*) are due to a metastasis of the typhoid bacillus, as proven in a case where its presence was manifest in the mesenteric gland, spleen and exudation over the convexity as well as at the base of the brain. Death occurred on the thirty sixth day during profound coma. The ulcers were nearly all in process of healing although the bacilli were still present in Peyer's patches. An examination of the blood during life revealed colonies of the same, showing the cause of distribution.

Sulphonal in the Night Sweats of Phthisis.—Combamale and Descheemaker (*Revue de Therapeutique Medico-chirurgicale*), except in the very advanced stage of tuberculosis when effect is merely negative, give from fifteen to thirty grains of sulphonal each night for the night sweats.

The Carasquillas Treatment of Leprosy.—The International Executive Commission of the Pan-American Medical Congress is advised, through Dr. I. M. Calnek of San José member for Costa Rica, that the government of that country some time since commissioned Dr. Elias Rofas of San José to go to Bogota, Republic of Colombia, and study the treatment of leprosy according to the method of Dr. Carasquillas. After careful study of the disease itself, of the treatment and its results Dr. Rofas returned to San José and reported favorably to his government. The treatment has been applied in one case of tubercular leprosy in Costa Rica and the patient has improved.

An Iron and Quinin Tonic Without the Tannate of Iron Precipitate.—G. Patein has a study of Martial medication in chlorosis (*Nouv. Remèdes*, July 24), endorsing it in general, given with moderation and as indicated. He rejects a number of the preparations in vogue but approves of protochlorid of iron (pills containing 0.10 gram ferric chlorid), and also of iodin of iron, especially for struma and lymphatic conditions. He has found that glycerin prevents the formation of tannate of iron and gives the formula of a tonic as follows: Tartrate-ferrico-potassic, 10 grams; extract of quinin, 10 grams; glycerin, 20 grams; aq. dest., 10 grams; Madeira wine q. s. to make 1 liter. He considers mineral waters a good supplement to increase the amount of iron taken with the food.

The Causation of Puerperal Eclampsia.—The nephritis which coexists with eclampsia is mainly secondary and analogous to nephritis of scarlatina. The liver deals more rapidly with the nitrogenous products of metabolism than with the non-nitrogenous moiety. The authors suggest that in pregnancy the increased work thrown on to the liver may result in hepatic inadequacy and that there may be a "liver of pregnancy" just as there is a kidney of pregnancy. The products of metabolism in both fetus and mother are carried to the maternal liver where they normally undergo katabolic changes to urea and bile salts; but in cases of hepatic inadequacy these products accumulate and eclampsia results. Strumpf found acetone in the urine of all eclamptic patients, whose breath smell of it. The relation of acetone to metabolism is so important that the urine of pregnant women should be systematically examined for it.—*American Journal of Obstetrics.*

A Case of Gonorrhea in a Girl of Twenty-six Months old.—Dr. Alfred Hinde of Chicago, reports the following: Under my charge at present is a girl of two and one-half years of age who was referred to me because of an obstinate catarrhal conjunctivitis of each eye. In appearance there was nothing unusual in the eye disease, but on questioning the mother the fact developed that the child had had a vulvar discharge for four months. On examination this was found to be profuse and purulent. Slides were taken of the eye and vulvar discharges, stained and examined, and in the eye slides the ordinary microbes were alone found; but in the vulvar slides a large number of gonococci were present in each one. A leucorrheal discharge in the mother was found to contain a few gonococci, and the father was said to have contracted a typical gonorrhea one year ago which had resulted in a marital separation at that time.

Radical Cure of Prostatism.—R. Macias attributes the troubles known as prostatism to exuberant growth of the gland compressing the urethra, or extending into the bladder with more or less irregularity in the size of the canal left for the passage of the urine. He treats the former condition by inserting the largest catheter possible without injury, guiding it with the index finger in the rectum, and then incising down to it with a bistoury. An Otis urethrotome is introduced and the incision made as indicated. The forefinger is then inserted and the condition of the bladder explored. If nothing is found there the operation consists merely in scraping off with the finger nail, the protruding growths of foci, of suppuration, concluding with the use of small curettes. This is usually all that is needed in all but senile cases. When the exuberance rises into the bladder he incises and removes the tumor with the electrocautery inserting the wire with a sharply curved needle on a handle, cutting the growth into quarters and pediculising each quarter for its final extirpation with the wire introduced with a straight blunt needle at the base close to the cervix. The *Revista de Anat. Pat. y Clin.* July 1, contains a full, illustrated description of the process and instruments as presented at the Second Pan-Amer. Congress.

Avulsion of the Uterus and Adnexa; Recovery.—The following case of avulsion of the uterus is reported by Dr. E. Hickson Smith, in the London *Lancet*. The recital is substantially thus: The patient gave birth to a child while on her hands and knees on the floor. The midwife some two hours afterward, having separated the child, etc., found a lump protruding which she mistook for the head of another child and pulled upon it for three quarters of an hour until she had dragged it away. Dr. Smith on arrival found an inverted uterus, which he turned back again. This proved to be the whole of the uterus and cervix with its peritoneal covering and one broad ligament with fallopian tube, but minus the ovary. The broad ligament of the other side was congenitally absent. On inserting the finger into the vagina, it moved freely about among the intestines, and the absence of the uterus and cervix was distinctly apparent. Hemorrhage was slight. To avoid prolapse of the bowels and general peritonitis, recourse was had to decubitus, an antiseptic plug, morphia and a strictly milk diet. The peritoneum closed up and the top of the vagina cicatrized over, the patient being able to go about in three weeks. Three months later a professional call found her in her usual health and the vagina a *cul-de-sac*.

Eucain Hydrochlorid in Rhinolaryngology.—Zwillinger in *Pesther Medico-chirurgische Presse* states his preference for the above over cocain, although the latter yields an intenser and more permanent anesthetic effect. His experience with eucain in rhinologic work has been only such as is obtained by painting the mucous membrane with a solution of the drug. That eucain has less disturbing effects than cocain has been the general report, but that it is not wholly free from by-effects is seen from the following: Eucain itself, however, possesses unpleasant by-effects which may limit its employment for affections of the nose and throat, but to what extent it is impossible to say. These by-effects consist in a burning sensation, which even in very dilute solutions occurs at the place of application. In nearly every case patients make more or less mention of the irritation which is accompanied by copious water secretion from the nasal cavity. The hyperemia caused by eucain, slight as it is, may also limit its use in some special cases; but on the other hand, the fact that it produces no ischemia increases the value of the preparation in the therapy of other nasal diseases. As regards the permanency of the solution, eucain possesses a great advantage, as it keeps well, and can be sterilized with boiling, without decomposition. The conclusions to which he has arrived are as follows: 1. The 2, 5, and especially the 10 per cent. aqueous solutions of eucain, produce such a degree of anesthesia when applied to the mucous membrane of the nose, throat or larynx that local operations can be carried out without the slightest pain. 2. The quantity which suffices to anesthetize the mucous membrane is completely innocuous. 3. The employment of eucain in diseases of the nose or throat is only limited by the slight irritation caused by the solution upon the mucous membrane, and also by a slight hyperemia which it causes.

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SATURDAY, SEPTEMBER 4, 1897.

THE ARMY EMERGENCY RATION.

The emergency ration established by G. O. 49, Hd. Qrs. of the Army, A. G. O., Washington, D.C., Dec. 5, 1896, has recently been subjected to a practical test in the field, the results of which have been reported as entirely satisfactory. This is to be appreciated the more because we have in vivid remembrance the disastrous results of a test made in the Department of the Colorado of an emergency ration suggested by the officers of that department. The test of the War Department ration was made by troops from Fort Sill, Oklahoma Territory because on account of the absence of settlers, on the Indian reservation, a command could march for the required number of days without having to camp or to pass within twenty or more miles of any settlement where the troops might obtain any article of food unknown to their officers. Deputy Surgeon-General SMART was ordered from his station in Washington, D. C. to accompany the command and to report on the condition of the men before, during and after the march. The report of the commanding officer of the troops has already been published in the military journals and from it has been learned the successful issue of the expedition. This is of the highest importance from the military point of view, because it demonstrates the ability of a cavalry or infantry command to cut loose from transportation for ten days and marching by by-ways or even by compass to seize an unguarded position or make an unexpected attack on the enemy. But we are not concerned at the present time with the military results. Dr. SMART's report to the war department has been rendered but will probably not appear in print until the publication of the annual report of the surgeon general of the army in September next. We have learned, however, some of the conclusions reached by him as the result of his observations.

The expeditionary command consisting of two officers and forty-four men engaged in active field service on the emergency ration, while a control experiment in the form of one officer and nine men on full field rations made similar marches on parallel lines but beyond communicating distance. The question at issue was: Would the limited emergency diet satisfy the men, many of them young and untried soldiers, and enable them at the end of ten days of active field work to meet an enemy or be available for a continuance of active field service? The record shows that the command lost in weight an average of 2.935 pounds per man, but part of this loss was due to the change of conditions from garrison life to active field service, for the men of the control experiment, with as much as they desired to eat, lost an average of 1.35 pounds per man; but the loss of weight of the emergency command was not associated with any loss of strength, for the dynamometric pull was twenty-four pounds greater per man at the end than at the beginning of the experiment. In fact Dr. SMART is reported as having said that the command returned to Fort Sill in better training and athletic condition than when it started out from that post, "and as I am confident that I myself could have started out that day and repeated the ten days' experiment I am confident that every soldier in the troop could have done so."

The emergency ration was intended to constitute a maximum diet for hard labor. It consists of those articles of food supply with which the soldier is familiar, as emergencies are not the times to make any material or experimental changes in his diet. The limit to be carried on the person or horse was announced as five days' rations, because emergencies would seldom last longer than that period; and, therefore, during the majority of emergencies the soldier would have the benefit of the most generous diet; but should an emergency require it the five days' rations were expected to be economized and to last for any number of days not exceeding ten. It was conceived that if an emergency lasting ten days should occur it would be one of extreme gravity and of such a character as to call for self-sacrifice on the part of the troops. When thus made to last for ten days the men were reduced to live on what is called subsistence diet, a diet sufficient for the repair of the waste incidental to the carrying on of the vital processes but leaving all work productive of external results to be effected at the expense of the tissues of the individual. When used in this way the daily allowance per man consists of 8

ounces of hard bread, 5 of bacon and 2 of pea meal with coffee, saccharin, salt, pepper and tobacco. This is equivalent to protein 2.128 ounces, fat 3.809 ounces and carbohydrates 6.93 ounces, a total of 12 867 ounces per day, furnishing 147 grains of nitrogen, 3,159 grains of carbon and an energy equal to 2,055 calories. The daily newspapers speak learnedly of chemic and concentrated foods, thirty pounds of which will suffice to sustain a man for a year. There is before us at the present writing an editorial in a city daily to this effect in connection with the journey to the Klondike mines. The information concerning these chemic foods is derived from the advertisements of food manufacturers, but these have no basis in physiologic science.

On the limited ration above stated, Dr. SMART found, by the daily use of the scales, that young men lost more of their weight than older men, that short men lost more than tall men, but that heavy men lost proportionately more than the lighter weights. He holds, however, that the manner in which the men utilized their ration of bacon had much to do with loss of weight. Some fried it to a crisp, tilting the melted fat into the fire and thereby losing more than two-thirds of its value. Others fried their hard bread, previously softened in water, in the melted grease and thus saved some of the hydrocarbon. Others, again, chopped their bacon into dice and boiled it in their pea soup, thus utilizing the whole of it. As to the frying of the softened hard bread in the melted fat, Dr. SMART remarks: "I am aware that this practice is denounced by most authorities on dietetics, but I have yet to discover in a very extended experience any harmful effects from this method of cooking, either among healthy young soldiers or hardy old soldiers." It would seem that when the system is on short allowance it is ready to utilize food supplies however presented.

On this diet which, although less in weight than the subsistence diet of the physiologists, has a higher energy from its larger proportion of fat, some of the men gained in weight. It is evident, therefore, that the subsistence diet of the physiologists is overestimated; that men can live and work and be strong on a much smaller quantity of food than is usually considered necessary, and that, in fact, the amount of food generally used is far in excess of that required by the necessities of the human system.

This experimental march reported by Dr. SMART has also a financial aspect which is of considerable importance and which requires only to be mentioned to be appreciated. The two officers and forty-four men of the emergency ration command lived an active life on a ration, tobacco included, which cost only about 9 cents per man per day.

Let us have a Department of Public Health!

THE FATE OF THE IDIOT.

There are in the United States about 95,000 beings hopelessly idiotic. Their existence and care is a problem perplexing alike to the sociologist, the political economist and the physician. It is beyond question that the simple endurance and perpetuation of this load of useless misery that has been habitualized by our modern civilization might and should be settled in a somewhat different way. Of what use to humanity, to civilization or to science, is it to go on as we are at present going? There is no truth so well established by history and by general biologic science as that the evolutionary process has been brought to its present position by a plan utterly different from that which we have adopted with our idiots. It is also plainly, painfully clear that the economic moral is no less striking and manifest. For every three or four of these wrecks kept alive by our sentimentalism one laborer's life must be continually sacrificed.

May we safely, do we wisely, reverse the universal biologic law as we are doing? Are we wiser than the cosmic process—call it God, or evolution, or what we please—and what if any are our real reasons, our unconscious motives, and what compensations may then be for our apparently illogic method? The writer has long pondered these problems, weighed the obscure and halting answers that have been hesitatingly advanced, has sought to give due allowance to the full importance of the religious and emotional, the psychologic aspects, and the possible baneful results of the obviously suggested natural method of riddance; as a result he can reach no other conclusion than that our duty to the future, to humanity, to the profession, and to the idiot himself is that, under law and publicity, and by a properly appointed commission the hopeless idiot should be put to death; and for these reasons:

1. In the consciousness of each one of us we are well aware that were we that being every dictate of kindness, every desire of our sane-minds, would demand that those in charge of us should not curse us with a continuance of life. We recognize that to us it would be cruelty, not kindness, to thus condemn us to such a hideous travesty of human existence. The psychologic argument is clearly pronounced.

2. Every parent of an idiot-child acquiesces, nothing more, in the present arrangement, but in his heart of hearts—the hopelessness being admitted—he wishes that his child should not thus be doomed by the mere unconscious vegetative processes of the body, and by a false sentimentalism upon our part, to a loathsome *reductio ad absurdum* of parenthood. The genealogic argument is quite as definite as the rational.

3. It is unjust to the present-day laborers to compel them by thousands to give their life-work to nourish and house and care for these things whilst the poor and would-be self-helping, the slum-children, the unlucky,

the unsuccessful, are dying about them because of the lack of the care given to and wasted upon the idiot. The economic lesson is as plain as the two preceding ones.

4. It is unjust to these unfortunates struggling for healthy and useful life and with every promise of hope in them, to give our superfluities to the ungrateful, unconscious, hopeless idiot. The ethics of the matter are likewise plain.

5. The religious feeling must take the same position. The soul of the idiot is certainly gaining no experience in its sad plight that can be of use to it in the future. Keeping it here only postpones a desirable beginning of education and progress.

6. It is unprofessional to do otherwise. This may at first seem strange and untrue, but it is really not so. Our duty of course is to cure disease—aye, but not to perpetuate it! At least it may be said, to ease and soften the end of disease in inevitable death. Ah, yes, but note the essence of the distinction: We are not to professionally establish a system for perpetuating the disease, doing nothing either for cure or for oncoming death. In our last sad offices euthanasia is a duty of our art when it is forced to renounce all possibility of help. Let it, then, be so here.

The whole argument turns upon the incurability of the disease, the utter hopelessness of any return to normal-mindedness. For all that makes life valuable the permanent idiot is already dead, because mere life of the body with worse than death of the mind, adds the horror of death-in-life, a fearful caricature of genuine life, not good either to the sane or to the insane sufferers who endure and support it.

In insanity there is hope, or possibility, however remote, of recovery. In incurable bodily disease there is the mind above it useful either to self or the world in some remote way. In every other type or example of disease there is a like element to give pause to other motives. And at least and at last everywhere else there is some possible lesson to be gained psychologically or pathologically by the scientific-minded student. But in the idiot it is not so, or but most rarely so. What lessons have we derived or are we seeking to learn from a scientific study of these cases? And we may foresee none except perhaps it come from human vivisection, which we neither desire nor will a righteous public sentiment permit.

We suspect that the real crux of the difficulty, the final bar in the half-conscious parts of the public mind preventing the admission of the cogency of the foregoing and other arguments not enumerated, lies in the fear of the psychologic purity of its own motives and character. Civilized humanity half feels that it can not trust its own religion and ethics which like a thin lava-cooled stratum lies over the volcanic brutality of fire, and the pent-up untamed fury of elemental barbarism beneath. The public consciousness distrusts itself, and fears if it should give away in this one evidently advisable procedure, the mountain itself would burst forth and again would come the antique savage pitilessness for the weak and the reign of brute force such as we see in Africa and in the animal world.

But the fear may be brushed aside. Surely civilization and law are more firmly based than that in our human life. We must trust ourselves and the future more than this, otherwise all progress is stopped, and we must settle down to an iron rule of routine and precedent. BAGEHOT'S "cake of custom" is much better baked than our fear would imply. And, too, humanity is ruled to some degree by reason and kindly motives, not by determinism and mechanics alone. If we assent to the death of the hopelessly idiotic, we need not, and certainly shall not, proceed to the slaughter of the sick, weak, insane, etc., etc. The method of civilization is discrimination, and there is no doubt we have learned to discriminate in other things, why not then in this? In law, because we pronounce the death-penalty upon the cold-blooded murderer, do we therefore punish in the same way the kleptomaniac or the drunkard?

It goes without saying that the proposal thus to dispose of these poor creatures must be safeguarded with every preventive of abuse and error. The decision may be vetoed by a parent, and only advised by a commission of scientific men from the legal and medical professions, chosen by the highest executive officers, and carried out with every wise precaution dictated by humanity and religious feeling. But it must come about that all such considerations having been duly weighed and all proper precautions having been established, the proper "medical treatment" of a hopeless case of idiocy will be finally recognized as a lethal dose of some anesthetic.

THE OCULAR MANIFESTATIONS OF INTRA-CRANIAL TUMOR.

There can certainly be no difference of opinion with regard to the utility of ophthalmic examinations as an aid in the study of diseases of the nervous system. While not invariably conclusive, the information gained by this means often decides the diagnosis and not rarely determines the treatment to be employed. That the findings are not always unequivocal while lessening somewhat does not wholly neutralize their usefulness. So-called pathognomonic or infallible signs or symptoms are to be viewed with suspicion.

The views of competent authorities as to the significance of optic neuritis in relation to intracranial neoplasms have been widely divergent, some insisting that the phenomenon is of the greatest diagnostic and localizing value, while others have contended with equal positiveness that it is entirely unreliable in these directions. With a view to shedding additional light

on this important question MARTIN (*Lancet*, July 10, 1897, p. 81) undertook an analysis of 600 cases of intracranial tumor derived from various sources.

As a result of this study it was found that in 513 cases in which the sex was stated, 353 (68.8 per cent.), occurred in males and 160 (31.2 per cent.), in females. The distribution of the new growths was as follows; cerebellum, 138; motor area, 120; frontal area, 61; pons and medulla, 45; parieto-occipital area, 37; basal ganglia, 36; centrum ovale, 30; temporosphenoidal area and multiple, each 28; pituitary, 26; general, 19; corpora quadrigemina, 15; corpus callosum, 13; crura, 5. The nature of the growths was as follows: Sarcoma, 126; glioma, 82; tuberculous, 72; cystic, 44; gumma, 36; gliosarcoma, 30; hydatids, 21; carcinoma, 11; other varieties, 179. A study of the chief situation of the headache in the cases in which this symptom was noted confirms the prevailing idea that this is of no significance in determining the position of the tumor. The number of cases in which tumors of the motor area and of the corpus callosum were unattended with headache is considered noteworthy, as well as the frequency of occipital headache in association with cerebellar tumor and of frontal headache in association with tumors of all kinds.

The results of the analysis as regards the frequency of optic neuritis are in accord with generally accepted statements. This manifestation is noted with such frequency in connection with tumors of the corpora quadrigemina that its absence may be considered sufficient to exclude this condition. Optic neuritis was found in all of five cases of tumor of the crura, but the number of cases is too small to justify definite conclusions. Tumors of the cerebellum and of the parieto-occipital area were attended each with optic neuritis in 89 per cent., of cases; optic atrophy was more common after the former than after the latter. Optic neuritis was comparatively uncommon in association with tumor of the corpus callosum and of the pons and medulla. It was commonly absent early in the course of tumors of the pons. According to the percentage, the order of frequency with which optic neuritis manifested itself in association with intracranial tumor was as follows: Corpora quadrigemina, crura, cerebellum, parieto-occipital area, frontal area, general, basal ganglia, multiple, pons and medulla, temporo-sphenoidal, centrum ovale, pituitary, motor area, corpus callosum. According to the percentage of cases in which optic neuritis appeared late, or was absent, or unilateral, the order of frequency was as follows: Cerebellum, corpora quadrigemina, parieto-occipital, basal ganglia, frontal area, pituitary, crura, general, centrum ovale, multiple, temporo-sphenoidal, motor area, pons and medulla, corpus callosum.

Only fifty-five cases could be collected in which the optic neuritis was unilateral or more marked on one side than on the other and of these the disturbance was more marked on the side of the lesion in thirty-nine and more marked on the opposite side in sixteen.

A study of the relation between the nature of the tumor and the development of optic neuritis showed the latter to be absent as follows: Tuberculous, 36 per cent.; gliosarcoma, 27 per cent.; sarcoma, 25 per cent.; gumma, 22 per cent.; glioma, cystic and carcinoma, each 18 per cent.; hydatid, 14 per cent.

Only thirty cases could be studied with regard to the relation between intracranial tumors and strabismus. Internal strabismus was found on the same side as the tumor in 23 cases and on the opposite side in four; and external strabismus on the same side in two and on the opposite side in one.

The general results of this painstaking and careful study are summarized as follows: 1. Of all cases of intracranial tumor 68.8 per cent., occur among males; 2. The most common form of intracranial growth is sarcoma; gliomata and tuberculous tumors are of about equal frequency, but less common than sarcomata. 3. Headache is more likely to be absent in connection with tumors of the motor area and of the corpus callosum than in connection with tumors situated elsewhere. 4. The tumor is generally situated on the side on which internal strabismus is noted.

Only limited localizing value is conceded at present to optic neuritis; but the hope is expressed that improved methods of examination now in course of adoption will give it greater value in the future. When a difference in the degree of optic neuritis in each eye exists it is more than twice as probable that the tumor is on the side on which the neuritis is the more marked. It should further be borne in mind: 1. That optic neuritis is constantly present in association with tumors of the corpora quadrigemina. 2. That it is present in 89 per cent. of cases of cerebellar tumor and of tumor of the posterior part of the cerebrum. 3. That it is absent in nearly two-thirds of the cases of tumor of the pons and medulla and of the corpus callosum. 4. That it is least frequently met with in cases of tuberculous tumor and is most common in cases of glioma and cystic tumor.

X-RAY INJURIES.

The extended use of the X-rays in surgical diagnosis has also developed certain inconveniences that attend their use, and the facts reported have received a very large amount of attention from the medical profession and the public. In popular estimation the occasional evil effects have been somewhat exaggerated, possibly in some cases to the embarrassment of physicians who desired to utilize this valuable diagnostic means. Among physicians themselves there has been some difference of opinion, and views that are without scientific basis are sometimes expressed

as to the nature and the mode of action of these rays. There is so much that is unknown in regard to them, and the room for speculation is so ample, that it is no wonder that this should be so, any more than that the most extravagant tales of their powers should be credited by the general public.

Dr. N. STONE SCOTT, consulting surgeon to the City Hospital, Cleveland, contributes to the *American X-Ray Journal* for August a discussion and review of all the reported instances of injuries from this cause that he has been able to collect, with the special purpose of proving or disproving the assertions of some who have held that the deeper seated organs could be thus affected. In order to do this and to obtain all the information possible as to these injuries and the best means to avoid them, he sent out circulars to all the leading operators with these rays, asking for particulars of X-ray injuries, including the kind of apparatus, length of spark, number of exposures, distance of the platinum from the part exposed, and the character of the injuries themselves. The answers received, in his opinion, cover some twenty thousand applications, and include thirty-one cases of injury, which are tabulated together with those he was able to obtain in the literature. In all he reports sixty-nine instances, including twenty-four collected by Dr. GILCHRIST of Johns Hopkins Hospital, whose views as to the production of periostitis he wishes especially to combat.

The general result of his study is that the X-rays undoubtedly do produce a dermatitis under certain conditions, chief among which are the distance of the platinum terminal from the skin and the length of the application. In two cases dermatitis or depilation was produced when the platinum was eighteen inches from the body, and in one of these the dermatitis followed three not very long applications aggregating less than an hour and a half. In three others burning pains followed a single application of less than half an hour with the platinum terminal ranging from ten to twenty inches distance. It would appear, therefore, that while in most cases the skin is affected only by long continued or close applications, or both together, there are some cases where, through idiosyncrasy, short and distant ones will have the same result. Dr. SCOTT's dictum that the most susceptible would probably not be affected by an hour's exposure if the terminal is ten inches away, is hardly supported by his tables.

In six of the tabulated cases, deeper structures than the skin are described as being affected, all of which he discredits to the extent of doubting the agency of the X-rays. In one of these, however, the case of cystitis reported by Dr. LYNN THOMAS in the *British Medical Journal* in March of this year, he admits that they may possibly have aggravated the irritation caused by the calculus and thus furnished the last straw that brought on the trouble. In two out of three cases of possible induction of periostitis he thinks a *post hoc* deduction was made, and that the disorder was merely a coincidence, not an effect. In regard to Dr. GILCHRIST's case, he analyzes it and attempts to show that it has been misinterpreted and that the skiagraphic evidences depended upon for the diagnosis were due to unequal exposures. He has produced the same appearances in perfectly normal hands by shading the thinner parts during part of the exposure, and he claims that the same result can be due to the thickened skin. As an X-ray expert, Dr. SCOTT's opinion is worthy of consideration, and as regards this special case he offers some valid arguments against the conclusions that have been deduced from it. It would not seem impossible, however, when we take account of the depth to which the dermal structures are often implicated, the subsequent deep and obstinate ulcerations sometimes reaching the bone, etc., that underlying parts might also be sometimes involved. A tibial periostitis would certainly seem a possibility, and there are other localities almost equally liable. The objection to the other cases, that there have been many hundreds of examinations without the production of similar injuries, only proves their rarity, and is not an argument against their occasional occurrence. His paper is not conclusive as regards this involvement of deeper structures, which is still to be considered an open question.

Dr. SCOTT briefly reviews the theories that have been advanced to account for these lesions, and makes no pretense of adopting any one of them. Electricians and not physicians are the ones to solve this question and he only concludes that if they are not produced by these rays themselves, it must be by something that accompanies them as any substance permeable by them is no protection. The natural deduction from this, which he does not make, would be that the skin itself is not necessarily a protection to the underlying parts.

The practical conclusion from his study is that to prevent X-ray lesions, the exposures should be short, not exceeding one hour for a distance of ten inches from the terminal and should not be repeated until a sufficient time has elapsed to show that no bad effects are likely to be produced. If repeated short exposures are made, the slightest bad symptom should cause their discontinuance. To this might be added the more general and comprehensive requirement to make the distance as great and the time as short for each application as is possible for the purpose required. We have as yet had hardly more than eighteen months experience with the X-rays, and know too little of their nature and the possible modifications of their action by idiosyncrasies, etc., to formulate any positive rules for safety in their use. Dr. SCOTT's paper, notwithstanding a certain bias that it displays, is on the whole a valuable contribution.

MEDICINE AND LETTERS.

The *Lancet* quotes Dr. OSLER as having said of the late Dr. OLIVER WENDELL HOLMES, that he was the best example that has yet been afforded by history of the successful combination of the physician and the man of letters. The combination is rare for many reasons, some of which lie on the surface while others are more remote. The career of a medical practitioner is an arduous one, and except in a few favored cases leaves little leisure for the successful prosecution of literary pursuits. On the other hand, for the attainment of any high degree of literary excellence ample time for reading, study, thought, and in a general way for self-culture is usually indispensable. Again, the physician is immersed in studies and duties which do not lend themselves very readily to literary expression, and he is prevented by professional etiquette and by good taste from making free use of the incidents of ordinary life as pabulum for authorship. Where gifts for practice and gifts for literature have co-existed in the same individual, the tendency has always been for one or the other to swallow up all the individual's energies and to brook no rivalry. Readers of HIPPOCRATES and GALEN will probably agree that if these distinguished men had not elected to be great physicians, they would have been great writers, and a similar feeling comes over us now and again when pursuing the lectures of Sir THOMAS WATSON. Much commoner has been the phenomenon of the born poet, essayist, or novelist taking to medicine by some untoward accident, failing miserably, and then later discovering his true *métier*. Such was the case of GOLDSMITH, of SMOLLETT, and of KEATS. Of high excellence in medicine and literature the following examples occur to us, viz., Sir THOMAS BROWNE, ARBUTHNOT, OLIVER WENDELL HOLMES and JOHN BROWN. A true born poet, a born essayist, a brilliant and kindly wit, OLIVER WENDELL HOLMES deserves to live long in the memory and affection of mankind.

Though Dr. HOLMES finally all but abandoned medicine for literature, his professional training and experiences continued to color notably his literary productions. In the natural felicitous use of medical terms and ideas, free from every trace of pedantry, he has no rival. What can be more delightful than the following passage which we select almost at random: "Saddle-leather is in some respects even preferable to sole-leather. The principal objection to it is of a financial character. But you may be sure that BACON and SYDENHAM did not recommend it for nothing. One's hepar, or in vulgar language liver, a ponderous organ weighing three or four pounds, goes up and down like the dash of a churn in the midst of the other vital arrangements at every step of a trotting horse. The brains also are shaken up like coppers in a money-box. Riding is good for those that are born with a silver mounted bridle in their hand, and can ride as much and as often as they like without thinking all the time they hear that steady grinding sound as the horse's jaws triturate with calm lateral movement the bank-bills and promises to pay upon which it is notorious that the profligate animal in question feeds day and night."

"OLIVER WENDELL HOLMES is the best known instance which the century affords that medicine and letters are not necessarily opposed, and that there is no inherent antagonism between the qualities which constitute a wise physician and an efficient anatomist and those of the poet, humorist and sage. We rejoice that it is so. In these days of all-absorbing science the claims of literature recede, perhaps rightly, but it will only be for a season. Literature is perennially interesting, perennially fruitful. We trust the members of our profession will always be its lovers and not rarely its successful cultivators."

THE BRITISH MEDICAL ASSOCIATION.

The meeting of the British Medical Association at Montreal, which began August 31 and continued until Friday, September 3, was a notable event for our Canadian *confrères*. The selection of the place of meeting of this body and of the British Association for the Advancement of Science in Canada this, the Queen's Jubilee year, is in a measure possibly an indication of the new imperialism that it is the present English policy to establish, and will undoubtedly have an influence to draw Canadian and British medical and scientific men more closely together. Science, however, does not recognize strict national boundaries, and the program as published contains a very large proportion of papers from invited guests from this side of the line—enough, it would almost appear, to make the occasion an international one for the Anglo-Saxon race in America and Great Britain. It is well that this is so, not that we have any desire to encroach upon the privileges of our Canadian brethren, but because there should come nothing but good from the closer association of medical men of the same race, however separated politically. It is to be hoped that the meeting has been such a success in every respect that it will be repeated at some not very distant year.

CORRESPONDENCE.

LETTER FROM SWITZERLAND.

On Asiatic Plague and Cholera Centers.

ESCHENZ, CANTON THURGAU, SWITZERLAND, Aug. 12, 1897.

To the Editor:—One phase—and by no means the least important—of the vexatious Oriental question is how best to meet the threatened invasion both of Europe and America by the allied forces of the two great Asiatic powers, *Plague* and *Cholera*.

"All is fair in love and war," thought Solomon, when reflecting on his own origin, and espionage is an honest trade, pro-

vided one avoids being caught, for knowledge of the enemy's habitat and home life is of paramount value whether warring against pestiferous microbes, the Saracens or other powers of darkness; hence I have thought that a few brief sketches of the principal strongholds and recruiting camps of plague and cholera by a spy in the service of Hygeia might interest the readers of the JOURNAL, who are fellow soldiers, serving with me in the same army, though detailed to other lines of duty.

Before proceeding, however, I wish to ask: Are we forever, in this perpetual struggle against foreign pestilence, to merely remain on the defensive, with pharisaic self-consciousness of superior cleanliness and quarantine blunderbusses pointed eastward? This policy is in perfect harmony with our manner of protecting our Christian brethren in the land of the dawn against the cruelties of Muslim fanaticism with palaver and resolutions of mild disapproval; but is it wise? Is it humane? Why not attack the enemy's armies on their own soil, sterilize their breeding grounds and root out the whole brood, thus once and forever putting an end to this costly warfare.?

During the month of Zil-Hijjah, which this year corresponds with our May, vast hordes of bacteria of various denominations assembled at their annual rendezvous, Mecca, where while planning the ensuing year's campaign, they indulge in unrestrained riot and feasting. Their doings are never reported and their victims are never counted; vultures and other carrion-eaters constituting the only efficient health board. Perhaps the greater number of pilgrims arrive by over-land routes, whereby no barrier to entering the Holy City is encountered. Those from India and the Persian Gulf region come by sea, and these, if the ship carry more than one hundred pilgrims, must undergo quarantine inspection at Kamaran, while those from the north, Egypt and Northern Africa are inspected at Tor. But who knows anything of Turkish quarantine knows it is only a sham, a piratical black-mailing device, and bold indeed must he be who would seriously attempt to hinder a pilgrim from being at Mount Arafat on the 9th, the eve of the Feast of the Sacrifice, when each pilgrim must with his own hand slaughter a sheep. Imagine the effect of such wholesale carnage and an hundred thousand or more putrefying carcasses? True enough, man and beast gorge themselves with mutton, but the blood and entrails alone will poison the air for miles around before consumed by Araby's scavengers. Until the sanitation of Mecca shall be backed up by European military there is no betterment to be hoped for. An utter disregard for human life marks Muslim rule, and nothing is be expected from the Turk—except promises.

Leaving Mecca, then, with a caravan of surviving pilgrims and a firm resolve not to return while Turkish dominion continues to sway the destinies of mankind, we traverse the desert eastward into Mesopotamia, strewing the wayside with corpses as we journey on. Probably one-half of those who set out on a pilgrimage to Mecca never return.

Mesopotamia is a favorite resort for both plague and cholera—indeed Davidson says in his "Geographical Pathology" (page 281) that from 1856 down to 1885 the former was never absent from the country, but from investigations which I made while United States Consul at Bagdad, I believe this to be an exaggeration. The severest epidemic of this century occurred in 1831, when about one hundred thousand persons, or two-thirds of the whole population, succumbed. The horror of the situation was increased by the flood, which the city walls and embankments were unable to keep out; and 7,000 houses fell in one night, burying the inhabitants under the crumbled brick walls and other debris. The last epidemic occurred in 1871, and held on in various localities for considerable time. It is not likely that Mesopotamia will escape this year—indeed the pestilence may be raging now and the outside world be none the wiser; for whether a high or low mortality is to be reported and what name is to be given the disease causing it, is determined by the governor and health inspector in council, or even at times dictated from Constantinople.

The Persian funeral caravans are a source of great danger as well as revenue to this region. Probably no less than eight thousand corpses pass annually through Bagdad to their final resting place at either Kathmein, Kerbelah or Nedjef, holy cities, of which the first named is close to Bagdad and the two others some distance beyond the Euphrates. This traffic had, to the financial detriment of mosques, mullahs and merchants, been forbidden for some three or four years, when in the spring of 1894 the prohibition was withdrawn, and during the next six months more than twelve thousand defunct immigrants, many of whom had been dead from two to three years, arrived, each caravan bringing an hundred or more, and as the coffins were quite open in the seams and leaky, the odor was perceptible for several miles to leeward. The carpet and rug trade which had been languishing now began to revive, each caravan bringing a goodly supply to barter for other commodities. The choicest of these rugs are very old and have been kept in the daily living rooms of the natives for a couple of generations, exposed to disease germs of all kinds, before they are sent by the funeral caravans to Bagdad, whence they are exported chiefly to the United States to adorn the parlors of our aristocracy; while *en route* they serve as couch for the muleteers, many of whom sicken and die. How many billions of living tubercle bacilli or diphtheria bacilli, not to speak of plague bacilli and other imps, may not lie concealed in the meshes of such a rug! Let the quarantine authorities take due notice thereof and govern themselves accordingly.

Mesopotamia, below Mosul (Nineveh), is a low flat country partly desert, partly swamp land, intersected by numerous half-filled-up remains of ancient canals, monuments of agricultural industry in former and happier days, when according to Herodotus it was the most fertile region on earth, wheat yielding a two to three hundred fold harvest. It is subject to frequent inundations followed by pandemics of malignant miasmatic fevers. In the spring of 1894 the Tigris rose twenty-six feet and bursting through its banks in numerous places the desert for miles around was soon converted into a huge inland sea, many places from twelve to fourteen feet deep, with only here and there an island marking the site of buried cities, but for which, looking from the walls of Bagdad, there was a clear horizon all around. This lasted about six weeks, and as the waters subsided a luxuriant vegetation sprang up soon again to dry and wither, except in the lowest spots where stagnant water at a temperature of 90 degrees or thereabouts, and rapid decomposition of both animal and vegetable matter gave off noxious vapors for some weeks longer. As it was reported that the fellahs (tillers of the soil) along the river bank were dying in great numbers, and usually after only twenty-four to thirty-six hours' illness, I resolved on finding out the cause which, however, I already suspected, and armed with four ounces of quinin and two ounces each of calomel and Dover's powder I started down the river. The first hut I entered seemed deserted but for a couple of asses, a few sheep and a dozen of chickens in the filthy mud-walled enclosure, besides a million flies disporting around a dirty rag heap, kicking into which several sallow sickly-looking Arab heads popped out. On inquiry if they were sick the answer was in the affirmative. I then told them that I was a physician who had come to cure them, when they set up a terrible wail, lamenting their poverty and assuring me they had no money with which to pay me for my medicines. Evidently they took me for a highway robber or tax collector, which here amounts to about the same thing. But when I told them I would cure them "for Allah's sake" and did not want their money there was great rejoicing. I made each one swallow forty grains of quinin and twenty grains each of calomel and Dover's powder; and thus I went from hovel to hovel as long as my supply of drugs lasted. The result of their treat-

ment confirmed my diagnosis, congestive chill; for all got well in a couple of days, while others continued dying.

It is generally held here that great inundations are the precursors of the plague, but this is not always so. The Bedouin notion of the etiology of plague is this, that it is caused by eating the flesh in a more or less putrid state of deceased camels. That there may be a grain of truth in this the history of the epidemic of 1871 would seem to confirm, though it may of course be merely a coincidence that it broke out first in an Arab camp where such food had been consumed. What probably helps to spread pestilential diseases are the grave robberies, the clothes in which the corpse was buried being afterward worn by the robber or even sold in the bazar. For this and other reasons many bury their dead, even during epidemics, under the house in the cellar or sardab, where in summer the family also on account of the heat pass the day.

Bagdad viewed from a distance is a painter's dream, but from within a sanitarian's nightmare. A labyrinth of narrow crooked streets, concave from side to side, so that when it rains they are merely canals of soft slimy mud, into the middle of which one is constantly gliding while trying to move along by jumping from right bank to left, or again jostled up against the walls by the waterworks, donkeys with goat-skin sacks on their backs; again during the dry season one is being stifled and choked with dust composed of desiccated and finely powdered human and asinine ordure mixed with a goodly number of tubercle bacilli, as one cautiously steps along to avoid freshly deposited human excrements. Now enter with me a bazar where food (meat, bread, fruits and confectionary) is exposed for sale, beside children with purulent ophthalmia, and hungry, emaciated, vagrant dogs, reposing on ash heaps from the baker's oven, their bodies one mass of sores from snout to tip of tail (excellent material for a skin clinic), and too indolent or weak to even dispute with the crows the right to the sheep entrails, fish heads and other offal lying around all covered with flies (except during the hot season when most insects perish) that are alternately feasting on the pus exuding from between the children's eyelids, the living but denuded flesh of the dogs and the dainties we are to enjoy for dinner.

I will here remark, while thinking of it, that during the summer when there are no flies there is little or no ophthalmia; but in October when the flies revive an epidemic of sore eyes breaks out, especially among the children. Against this, I was with the utmost care and cleanliness unable to protect even my own child.

But continue with me the exploration we have begun. Let us enter a private dwelling of the opulent class, where, as the massive gate swings open, we find ourselves in a spacious court with orange trees and palms, on the branches of which thousands of birds give vent to their feelings in joyful song, while above in apartments furnished with barbaric splendor and iron-barred windows, recline on softly-cushioned divans, gorgeously attired women—often literally bedecked from head to toe with gold, diamonds, rubies and pearls—smoking the nargileh or hubble-bubble, and prattling. But take a look into the kitchen (on the ground floor), where in a corner is a heap of rubbish, egg shells, bones, etc., and beneath a capacious pit, into which the slops are emptied through a hole in the floor; or inspect the privy, a hole in the floor (no privy seat) communicating with a cellar beneath, near which, and separated only by a thin brick wall, is the well that furnishes water for dish-washing, etc., and the sardab or underground cave in which the family spend the hot summer days; all of which, slop-pit, privy-pit, well and sardab, are each spring when the river is high filled with water, that percolates through the porous soil and, to the great joy of the people, takes along with it when receding the year's accumulation of filth—truly, a land where dirt and diamonds dwell peaceably together. Again come with me to the river bank and watch the water-carriers scooping up the thirst-assuaging fluid (muddy and with a slightly brackish or saltpeter taste in spring; greenish, slimy, ammonaical in autumn) in some shallow, stagnant or eddying nook where fecal and urinary contamination is greatest, and stranded carcasses of camels, horses, sheep, buffaloes, dogs and cats perfume the surroundings, and may be you will call for whisky straight with your dinner. But our inspection is not ended till we have passed a night on the housetop, Bagdad's summer bed-chamber, with no roof but heaven's vault, no walls but the horizon, where fanned by the north wind, we recruit our daily strength in peaceful slumber, and as you gaze on the cloudless and richly illuminated expanse above, more brilliant here than anywhere else in the world, you will also understand old Father Abraham's astonishment when it was announced to him that his progeny should become as numerous as the stars and you will also understand why the Chaldeans took so readily to astronomy.

During the summer months no rain falls and the air is so dry that ink dries on the pen between the inkstand and the paper; when writing I found it necessary to dip the pen for every word and twice for a long one. The prevailing winds are from the northwest and though fiery hot imparting a sensation as if one were holding the face before the open door of a furnace, they are yet refreshing; but southwest winds are very disagreeable, one can hardly breathe, the air seems lacking oxygen and they are also known as the "sickly winds," the "breath of demons." The mean annual temperature ranges from 74 to 76 degrees, the highest observed in the shade being 128 degrees and the lowest 31 degrees. I have once seen it 116 degrees on the roof of my house at 2 o'clock in the morning. The temperature of the Tigris water in summer keeps also between 80 and 90 degrees. The following temperature table gives a fair average for dwelling houses on the river bank, where, however, it is considerably cooler in the summer than in the city further back:

Month.	Mean.	Max.	Min.	During ten years.	
				Max. Mean.	Min. Mean.
January	54	68	32	59	50
February	57	74	36	60	53
March	63	86	45	68	60
April	72	90	50	75	68
May	82	102	64	86	76
June	90	114	73	94	86
July	94	118	78	96	91
August	93	122	75	97	86
September	89	108	70	90	87
October	80	97	50	83	77
November	66	84	37	71	62
December	56	74	31	60	52
	75.5				

Mild winters are usually followed by comparatively cool summers and *vice versa*.

Along the Persian Gulf the mean annual temperature is higher (from 80 to 84 degrees at Bushire and Muscat), but the range rather less, the temperature rarely falling below 60 degrees or rising above 108 degrees; but on account of the humidity of the atmosphere the heat is much more oppressive. In my next I shall treat of prevailing diseases of Mesopotamia and also of the sanitary administration, especially during the cholera epidemic of 1893. JOHN C. SUNDBERG, M.D.

Health at School.

NEW ORLEANS, LA., Aug. 11, 1897.

To the Editor:—May I trouble you to give me a detailed statement in regard to Dr. Clement Dukes' "Health at School," referred to in the excellent editorial on swimming which appeared in the last JOURNAL? I should like to know where and by whom the work is published, the size and price. If you could refer me to other works bearing on the direction of physical training in schools I should be much obliged, as I

have undertaken to do work of that kind and wish to prepare myself for it. Hoping that this may not entail too much labor I am, with best wishes for yourself and the JOURNAL,

Very truly yours, H. B. G., M.D.

ANSWER:—See small work on "Swimming" by Martin Corbett (All-England series), London, 1890; also volume on "Swimming" in Badminton Library, by Sinclair and Henry, published by Longmans, Green & Co., a book of 452 pages with bibliography, London, 1893. Dr. Lagrange's work on "Physiology of Bodily Exercise." Appleton's International Scientific Series, 1890, has much useful information. "Physical Culture a Necessity," (*Vide* JOURNAL, Vol. xvii, page 513, Oct. 3, 1891.) See also Badminton's *Magazine of Sports and Pastimes*, Longmans, Green & Co., London.

The Diazo-reaction Test.

MINNEAPOLIS, MINN., Aug. 6, 1897.

To the Editor:—Will you please inform me in what number of the JOURNAL, if any, I can find an accurate description of the method of making the "diazo-reaction" test in diagnosis of typhoid. If none has been published will you not have space for it? Very truly yours, F. A. KNIGHTS, M.D.

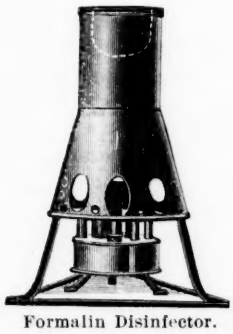
ANSWER:—*Vide* "The Diagnostic Value of Ehrlich's Diazo-reaction," by Charles L. Greene, M.D., University of Minnesota, JOURNAL, Vol. xxii, p. 356, Feb. 24, 1894.

NEW INSTRUMENTS.

A NEW DISINFECTING AND DEODORIZING LAMP, AND A NEW FORMALIN DISINFECTOR.

We present illustrations of a new disinfecting and deodorizing lamp for household use, and a new formalin disinfector. In this disinfector the formalin is employed as pastils (Paraform) instead of the formerly used fluid form. The pastils are vaporized and the formalin given off in its gaseous form, *i.e.*, its most active form, as it thus penetrates everywhere in the room and the most resistant pathogenic forms are entirely destroyed. Other advantages are the even distribution of the gaseous formalin, the cheapness and simplicity of the apparatus and the fact that it does not injure fabrics, etc., thus making it unnecessary to remove furniture, ornaments, etc., from the room to be disinfected. To disinfect a medium sized room from 100 to 150 pastils are vaporized.

Deodorizing Lamp.



Formalin Disinfector.

The disinfecting and deodorizing lamp is constructed on the same principle as the formalin disinfector, but is smaller. The light need not be extinguished as the lamp burns out with perfect safety. Pathogenic organisms of moderate resisting powers may be effectually destroyed by the use of this lamp, foul odors removed and a preservative influence lasting two or three days given rooms containing food tending to decomposition. Alcohol or wood alcohol is used in both to vaporize the pastils, 2 ounces lasting from two to four hours in the lamp, according to the flame, while in the disinfector the reservoir is filled three-quarters full of alcohol, or one-half full if wood alcohol is used. These are supplied by Schering & Glatz, New York.

PUBLIC HEALTH.

Yellow Fever in Cuba.—A report from Havana, via Key West, Fla., dated August 21, states that the Marquis de Ahumada has been very ill but is now improving. Gen. Muncader, chief-of-staff for Capt.-Gen. Weyler, is also ill with the fever and for these reasons the latter officer has remained in Havana. The sanitary condition of affairs is supposed to be more alarming than the vague rumors admit.

Health of San Francisco.—The report of the Health Department shows 470 deaths for July, 1897, and 443 births, in an estimated population of 360,000. This makes the death rate for July 1.30 per thousand and 15.60 per annum. The principal causes of the July mortality were: Phthisis pulmonalis, 70; heart disease, 69; cancer, 36; violence, 33, and pneumonia 28 cases.

A Suspected Case of Yellow Fever.—According to the press reports the steamship *Finance* from Colon arrived at the port of New York August 21, and brought in a seaman who was taken ill three days before. The patient was removed to the Swinburne Island Hospital, and the second cabin passengers and the crew were transferred to Hoffman Island. The vessel was disinfected and allowed to proceed to her pier, where the cabin passengers were landed.

Destruction of Cargo of Grain by Mexican Board of Health.—The sale on shore of the cargo of grain on the American ship *Frank Rood*, stranded near Vera Cruz, was forbidden by the local health authorities, as the grain had been slightly wet. To prevent sickness from the decaying mass, the sea was allowed to wash it away, and the owners were paid $400 indemnity by authority of the National Board of Health.—*Boletin del Consejo S. de Salubridad*, June.

The Daily Water Supply of New York is 225,000,000 gallons. The new system is to add 65,000,000 gallons through the Fifth Avenue mains, and 20,000,000 by the others. The new aqueduct system is capable of producing 400,000,000 gallons should they ever be needed. New Yorkers seem to gloat over the assertion that the pumping costs Chicago four cents per thousand gallons, while the cost to New York for the same volume is only two and a half cents. Happy is Chicago to be mentioned in the same breath.

Joyful News for School Children.—In Marpman's bacteriologic institute at Leipzig, the ink bacillus has been discovered and duly named. Out of fifty-seven different kinds of school inks examined, most of them made with nutgalls, the greater number contained bacteria. School inks colored with an anilin dye, even though the bottle had only just been opened, contained the micro-organisms already mentioned, and the number of bacilli was the greater the longer the ink had been exposed to the air. From such an anilin ink, which had been in an open inkstand for three months, a specific bacillus was isolated and mice were inoculated with it. After four days they died of blood-poisoning.

The Most Populous Block in New York according to the Federation of Churches and Christian Workers is on the West Side, and is bounded by Amsterdam and West End Avenues and 61st and 62d Streets. The population count is 3,580. Squalor reigns supreme. Irish, Germans, Italians and Austrians furnish the material for racial wars. The Hebrew is the only absentee and the Austrian butchers constitute the only placid element. The "head of the family" wages averages $12.50 per week. Three tiny, narrow rooms are the most a family can expect, and for these a rent of $10 to $12. The 3,580 people live in 2,639 rooms, the kitchen always the "living-room," and less than twelve hundred of these have an outside window. The tenements are all patterned alike, one long row of dull red brick structures that, save for the cramped stoops, might

as well be factories. The block has an environment all its own. Despite the crowding of the region, many lots to the north along West End Avenue are vacant, the rocks that in places are miniature cliffs have not been blasted away, and there are still some remnants of "Shantytown" overlooking the railroad track. Heaps of lumber and rods of sewer pipe extend in every direction. Strange to say these dwellers upon the steep hill care but little for the partition bath tubs of ingenius owners, not as much perhaps as for the marble palaces on Fifth Avenue. A proposed North River bridge may disperse the tramps from the railroad and New York may yet have an opportunity to weep for those sanitary sins, which to her seem the most precious.

Health in New York.—The report of the State Board of Health for July shows a mortality of 11,235, greater than that of June by 2,200, but 1,400 less than that of July, 1896. Compared with June, 1897, deaths were as follows: From diarrheal diseases, 1,900 more; from diseases of the digestive organs, 300 more; from accidents and violence, 200 more; indefinite causes, 200 more. Diphtheria decreased by 100 in mortality; scarlet fever and measles somewhat; and respiratory diseases by 250, while typhoid fever moderately increased. The death rate from all causes was 20.50 against 16.75 in June, 45.5 per cent. of the deaths occurring under five years of age, against 31.5 per cent. last month.

The Percentage of Diseased Cows in the City Limits of New York is put down at 16.3. The board has supervision limits over 2,700 cows. The milk from 550 of these is consumed by the owners, and the rest sold. Of these cows 1,139 were examined by experts and 186 were condemned as diseased, after being subjected to the tuberculin test. The official diagnosis was confirmed in each case at the autopsy. The tuberculin used in the tests was produced by Koch's method at the board's laboratories. President Wilson says that he is satisfied, faom the work of the officers having supervision of the city's milk supply, that milk will continue tainted to a greater or less degree until the authorities of Connecticut, New Jersey, Pennsylvania and Massachusetts adopt as rigid laws as are enforced by the New York Health Board. He meekly intimates to taxpayers that more ample appropriations would be gratefully received.

Alcohol at Rouen.—The liquor dealers sell more to families at home than across the counter. To study better this frightful state of affairs, Dr. Brunon took service as a waiter in one of the liquor shops, which number fifty to each one hundred houses in town. He relates that it is a frequent practice for a family to order a liter of alcohol, which it was his duty to deliver early in the morning. A large soup tureen was filled with slices of bread, boiling coffee poured over them, and the soup seasoned with half the alcohol. This is the morning meal for the whole family, including the children. If there are more than four in the family, the entire liter is emptied into the soup. They are not hungry afterward during the day, but the thirst is inextinguishable till evening. There are 4,600,000 liters of alcohol consumed annually by a population of 112,352 (census of 1891).—*Gaz. Méd. de Liège*, July 22.

Oysters.—"A recent official medical report, published in the London *Lancet*, quotes with approval the words of Prof. Conn that the public health is placed in jeopardy when oyster dealers, for the sake of producing plumpness, place oysters in the mouths of fresh-water creeks in close proximity to sewers."—*New York Med. Record.* There should be a law prohibiting this practice, but such a law would necessarily be enforced with difficulty. Dr. Klein has made some very interesting examinations of oysters, concerning the possibilities of infection from sewage, to which the London *Lancet* of December 5, devotes considerable attention. While these examinations may prove impurity and hazard, it is difficult to state the precise nature of the specific hazard. It is unfortunately true that the typhoid bacillus has been found by Dr. Klein in one instance. Another very interesting paper on "Oyster Culture and Disease," is to be found in the *Brit. Med. Jour.* of Nov. 20, 1896. The investigations of Dr. Cartwright Wood, concerning typhoid fever germs in oysters, while they confirm the opinion of Dr. Klein that shell-fish can carry infection after exposure in polluted salt water, do not consider the possibilities of infection arising in the oyster after it has been removed from salt water. The oyster is undoubtedly capable of absorbing poisons, not only through the medium of water, but also by means of exposures to foul air. We are well aware how rapidly milk absorbs odors, whether of a poisonous nature or not, and this property oysters also possess. A putrid infection is readily induced in structures so favorable for infection as the oyster or clam. Atmosphere loaded with disease germs imparts a contaminating influence to jellies, vegetables, meat, and bread, as well as to milk, fish and oysters. A wholesome storeroom is the suggestion, not the rule.

The Sanitary Regulation of the Sleeping Car.—The Louisiana State Board of Health has recently investigated the subject of the sanitary defect in our sleeping-car systems, and the following resolutions have been adopted: Be it

Resolved, That every sleeping-car entering the city shall, on its arrival, be thoroughly cleaned and disinfected, under the surveillance of our sanitary inspectors, as follows: 1. The towels, bed clothes, etc., to be submitted to a vigorous disinfection by ebullition in water for an hour, or sterilized in an autoclave or steam oven. 2. The closets and cuspidors (these should be of china-ware, not metallic) to be washed out with antiseptic liquids and always provided with a supply of such solution. 3. The car proper to be disinfected by means of formalin. This agent positively kills or destroys the germs of tuberculosis, diphtheria and smallpox in a few minutes. It causes no appreciable injury to the woodwork, upholstery and carpets. The method of applying it is very simple. It can be applied in the form of fumes or by a special apparatus. It applies to mattresses and pillows and cushions, as it possesses most penetrating properties. The disinfecting process can be carried out quickly and at little expense."

The subject of car sanitation is one that appeals to the large majority of our population on account of its possibilities in regard to transmission of contagious diseases. That such diseases may be transmitted in this manner is admitted by all sanitarians, and the danger of contracting diphtheria, syphilis, eruptive fevers, etc., from lack of cleanliness in sleeping-coaches, is not a remote possibility, but an actual reality. The transmission of tubercular disease in this manner has been disputed, but there is no doubt but that in certain depressed conditions of the system, when the ordinary forces with which nature surrounds us to guard against the encroachment of infectious diseases have been weakened, that the inhalation of dust containing tubercular matter is wrought with serious danger. The subject of the sanitary regulation of sleeping-coaches is one of the utmost importance, and these regulations should be made universal. The adoption of proper resolutions by the Louisiana State Board of Health is of importance not only locally, but it may be the entering wedge for the establishment of similar laws in other parts of the United States. If such laws existed in New York, Ohio, Pennsylvania and Illinois as well as in Louisiana, it would be a fairly satisfactory guarantee that travel east of the Mississippi had been deprived of its worst sanitary dangers. Such a movement would soon be followed by similar regulations by other States, so that finally traveling in the United States could be undertaken without the danger of contracting diseases to which we are now exposed by the unsanitary condition of the sleeping-car.

Report of a Study-travel to the Tuberculous Establishments of Germany and Switzerland.—Edv. Kaurin (Director), Molde, Norway, who has been nominated for the directorship of the first popu-

ar hospital for tuberculosis in Norway, used last autumn a traveling stipend to visit the tuberculous establishment of Falkenstein, the best known of Germany, and whose director s the Privy Councilor Dettweiler. He gives a detailed descrip- ion of this institution, which is situated most picturesquely n the mountains of the Taunus, 400 meters above the sea level. The establishment is very comfortably appointed, and is in very respect a model institution, having spacious rooms for he patients and several pavilions in the beautiful park sur- ounding it. At a short distance is the popular sanitarium of Ruppertshain, a very well organized place which was started bout a year ago, and which is much frequented by patients of mall means; they enjoy the best attendance for from two arks fifty pfennigs to five marks a day. The usual duration f the treatment is three months. In the two houses the reatment is hygieno-dietetic, Dettweiler's method according to Brehmer, which is based principally on the dwelling of the atients in the open air, in the winter as well as the summer, n large rooms open on one side, and on the hardening of the kin and a very abundant nourishment. Few medicaments re employed and on the whole there is only a symptomatic reatment. Results are quite satisfactory and there are 24 er cent. of cures. The author emphasizes the fact, which is roved by the statistics of the towns of Falkenstein and Görbersdorf, that there is no reason to fear that such estab- ishments may transmit the contagion to the inhabitants of he surrounding country. The contrary seems to be proved, s the frequency of tuberculosis diminishes in the regions, he establishments in question acting outside as educators ith regard to measures to be taken against infection. In witzerland the author visited Heiligenschwendig near Thoun, hich is the first in date of the popular sanatoriums of Switz- rland. It is situated in the Canton of Berne, 1,100 meters bove the level of the sea. This establishment has not been ong in activity and is calculated to receive about fifty patients, ut they have now begun to enlarge it so there will be room r 120 patients. The author also describes the Baselian the- apeutic establishment at Davos, which was not yet finished. t is a sanatorium founded by the city of Basel for its impe- unious sick. There is also the well-known sanatorium of r. Turban, and the Kurhaus of Davos. He mentions pen- ions, established in Davos, for young people with the begin- ing of phthisis or a tubercular disposition; they can there, nder the eye of a physician, go through a whole course of tudy, all the time taking good care of their health. He also peaks in detail of the climate of Davos. The sojourn in this ocality seems to be contraindicated only for high graded nemia and neurasthenia or pronounced cardiac weakness. The author then passes to the detailed description of the nstitutions existing at Görbersdorf, that is, the old estab- ishment of Brehmer, the sanatorium of Dr. Römpler, the stablishment of Dr. Weicker and his hospital for impecun- ous tuberculous patients. He shows what importance this chool of Görbersdorf attaches to life in the open air, in large ell-protected parks with numerous avenues, whose slopes re various. In the environs of Berlin the author visited the opular sanatoriums of Grabow, Malchow and Blankenfeldt. n the first of these localities the tuberculous are installed n huts *à la* Döckert, which have been put at the disposition f the establishment by the Red Cross, and built in a large ine wood. The two other establishments are built in the rrigation fields of the city of Berlin; their situation is in con- equence not excessively advantageous, but they were not riginally meant for receiving tuberculous patients. Both, owever, considering the short time of their activity, have urnished good results of the hygieno-dietetic method there pplied. Everywhere in Germany and Switzerland people ere most earnestly interested in the question of tubercu- osis. The struggle against this disease is engaged in, in both ountries, with uncommon ardor and a final victory is confi- ently hoped for.—*N. Mag. f. Laeger.*, No. 2, 1897.

The National Conference of State Boards of Health was held at Nashville, Tenn., August 18 and 19 and the following questions discussed:

"Should the tuberculous insane be isolated from inmates in our asylums, and accommodations provided for them in separate and detached buildings?" "What municipal ordinances shall Boards of Health advise for restriction of tuberculosis?" "What attitude are the State Boards of Health prepared to take regarding the new law for general inspection of dairy cattle, and what are the details of any practical scheme for inspecting herds supplying public milk, dairy produce, for dealing with animals which react to the tuberculosis test?" "To what extent should State Boards of Health be expected to furnish a diagnosis of contagious diseases within their jurisdiction?" "How far should mandatory measures go in dealing with measles, whooping-cough, leprosy and tuberculosis?" "Relations of National and State Quarantine?" "Should Boards of Health tolerate the feeding of hogs with offal from slaughter houses or meat from knacker's yards?" "Should the county jails and prisons of the different States be placed under the sanitary supervision of their respective State Boards of Health, which shall have them inspected regularly at stated intervals by a health officer appointed by them or under their control?"

In June a conference of baggage agents, health officers and funeral directors was held at Cleveland, Ohio. A committee representing this conference made a report "recommending changes and amendments in the present methods of embalming, disinfecting and transporting of dead bodies." We give a synopsis of the regulations recommended in this report, which with a few amendments was adopted:

1. The transportation of bodies dead of smallpox, Asiatic cholera, yellow fever, typhoid fever or bubonic plague is absolutely prohibited.
2. The bodies of those who have died of diphtheria, scarlet fever, glanders, anthrax or leprosy, to be accepted for transportation only when prepared for shipment by being thoroughly disinfected by arterial and cavity injection, disinfecting and stopping of all orifices with absorbent cotton and washing the body with disinfectant.
3. Bodies of those dead of typhoid, puerperal fevers, erysipelas, syphilis or other dangerous, communicable diseases may be prepared for shipment by filling cavities with improved disinfectant, washing the exterior of the body and stopping all orifices with absorbent cotton. In cases of contagious, infectious or communicable diseases the body must not be accompanied by persons or articles which have been exposed to the infection.

The Secretary was instructed to report this action to the executive officers of each State and Provincial Board of Health and request such action as they saw fit. Dr. Benjamin Lee of Pennsylvania, was chosen president; Dr. Formento of New Orleans, vice-president; Dr. Hurty of Indiana, secretary; Dr. Pelletere of Quebec, treasurer. The meeting for 1898 will be held at Detroit, Mich.

Alleged Unwholesome Meat in Germany.—According to the *Consular Reports* of February, a report to the United States Government from Cologne sets forth that the Germans are not satisfied with the kind of examination to which meat products for export are subjected before they leave our shores. The agitation appears to be conducted in the interest of the German agriculturalist. At a recent meeting of the agricultural association of the district of Cologne the subject of adulterating German sausages with American diseased beef was discussed. According to the Cologne *Gazette*, one speaker, in discussing this question, drew special attention to the fact that beef was examined for maggots in Germany but not so in America. Since, in the former country (Germany), sausages were more adulterated with American beef that was infested with maggots than with potato meal, the law in force in Germany against dishonest competition should also be applied in the case of sausages, which would require the marking of the goods as to whether they were of German or foreign origin and had been officially examined or not. Another speaker remarked that it made an immense difference to the welfare of the German people whether home or foreign meat was used; he therefore deemed it necessary that the origin of the meat used in

the preparation of sausage be given. A chemist present, in speaking on the same subject, said that American beef was not so profusely infested with maggots but that it came to Germany prepared with borax in an astonishing manner. On the exterior of the meat there was a complete crust of borax and the meat was actually pickled with borax. If sausages contained meat prepared in this way and were offered for sale it was clearly a fraud in the sale of foodstuffs. But this importation had only commenced with them as well as the discovery of its harmful effects.

SOCIETY NEWS.

The American Academy of Railway Surgeons will meet in Chicago Oct. 6, 7 and 8, 1897.

The Eighth Italian Congress of Internal Medicine is to be held at Naples in October. De Renzi and Marchiafava will present the subject of "Leukemia and Pseudoleukemia;" Cardarelli and Silva, "Cardiac Neuroses"; Fenoglio and Massalongo, "Chronic Arthropathy," while Devoto and Ferrannino will review the year's progress.

The Seventh Norwegian Medical Congress was held at Trondhjelm, August 3 to 5. Among the communications of more than local interest, we note that addresses were delivered by P. Aaser, president of the Norwegian Medical Association on "The Position of the Physician in regard to Life Insurance Companies;" "Psychiatric Diagnosis in Theory and Practice," H. Dedichen; "Medical Secrecy," Foerden; "Retention of Urine," K. Jervell; and "Heredity," E. Storen. Professor Laache is the official delegate from Norway to the Congress at Moscow.

Third Italian Medical Congress, Novi, June, (Ligurian). Prof. E. Maragliano delivered an address on the "Cure of Nephritis," which he bases on the principle of regulating the proportions between the nitrogen introduced and the nitrogen eliminated. This therapeutic indication is sufficient to cure acute cases and prolong life in chronic. He concluded with an urgent appeal to all physicians to follow the new scientific paths and seek to discover disease in its latent and early stages instead of waiting until it is so difficult to control. G. Ingianni reported the results of experimental research in suture of the vas deferens on dogs, inserting absorbable substances to facilitate the suture and hold the walls of the canals apart. In all his experiments, the two stumps united perfectly, but the canal remained impervious, which is contrary to the general assumption. E. Terrile of Genoa, described the pathogenesis and therapeutics of tuberculous polyserositis which he ascribes to toxins in the blood in the course of a latent or manifest tuberculous infection. The two cases he described were cured with Maragliano's serum. Prof. C. Poli of Genoa, referring to the operative cure of endocranial complications of purulent otitis media, described several cases in which the operation gave issue to pus from the lateral sinus, although no previous symptom had indicated this complication. As this represents the first stage of endocranial diffusion, he urges the necessity of being on the lookout for it and of investigating the condition of the ducts of the sinus in resection of the mastoid. Prof. L. Levi reported the fine results obtained by the use of endovenous injections of corrosive sublimate in the cure of the localizations of the gonorrheal virus in the articulations. The fever disappeared at once and also the pains in the joints. It is the first time that this treatment has been attempted. He concluded by calling attention to the serious complications of gonorrhea, which is too often neglected as of little consequence. Prof. L. M. Bossi suggested among other new obstetric regulations that the sanitary authority should be informed at once whenever abnormal conditions were found on combined vaginal examination, at the puerperium. Bajardi presented an improved tracheotome, which enables the operation to be performed in two parts, and without assistance or hemorrhage. It is a three-quarters curve and is introduced into the trachea guided by a hook previously inserted. L. Macaggi presented a female catheter, with a double flow, to secure permanent antiseptic irrigation in cases of vesico-vaginal fistula, which he considers of great importance. It is held in place by the sphincter. Prof. E. Sacchi reported favorable results in operations on the deferens, for prostatism in eighteen cases. L. Devoto stated that iron alone is not sufficient to cure chlorotic anemia, but that equal stress must be laid upon repose, suppression of liquids, use of mixed alimentation, disinfection of the stomach and intestines, and administration of sulphur with the iron medication. S. Personali mentioned that erythromelalgia does not represent, in all cases, a distinct disease, an autonomous neurosis, but that it often coincides with the repullulation of syphilitic symptoms, and is therefore a significant symptom. Sacchi presented a patient whose larynx had been extirpated *in toto* twenty months before, and replaced with an artificial organ. He can speak correctly and be understood even at a distance. Deamicis described a case of incoercible vomiting in pregnancy finally controled by chloronarcosis. Gasparini asserted that ulcerations of the nasal or oral mucosa are the cause of clonic facial spasms, and when they are cured, especially with anodic electrolysis, the spasms cease. The fine results obtained in infantile myxedema with thyroid extracts were confirmed again, and various deformity apparatuses for the jaws, etc., were exhibited, Giuria signaling the importance of applying such an apparatus at once before cicatrization has produced deformity. Prof. Morselli proposed a modification of the Sanitary Code to place foreign physicians practicing in Italy, especially in the Riviera, on the same footing as Italian physicians practicing in foreign countries, and not allow them so many privileges as at present. E. Roncagliolo proclaimed the efficacy of guaiac *per via epidermica* in the cure of erysipelas of the face. It has been in use for three years at the Genoa clinic, and has been found effective in arresting the disease in its early stages, and curing it when more advanced. The complications are rare. He believes that the guaiac neutralizes the toxic substances in the circulation by its direct or indirect action on the cellular protoplasm. —*Gaz. degli Osp. e delle Clin.*, July 18.

NECROLOGY.

M. A. MUNIZ, M.D., Lima, Peru, aged 36 years, Professor Med. Physics and Hygiene; Superintendent of National Insane Asylum, and Chairman of the National Board of Health. *La Cronica Medica*, June 30, is devoted to a review of his brief, brilliant career, and his indefatigable labors in general for the progress and enlightenment of his country. His articles on "Leprosy" and the "Demographic Statistics of Peru" won him membership in the French Société d'Hygiène. Those who attended the First Pan-American Congress at Washington may remember his interesting address on the Incas and his collection of Inca skulls.

DEWITT C. HOUGH, M.D., Jefferson, 1847, of Rahway, N. J., died August 25, aged 70 years.——George R. Kauffman, M.D., Bellevue Hospital Medical College, New York, 1867, Chambersburg, Pa., August 13, aged 56 years.——George Y. Lehr, M.D., Jefferson Medical College, 1863, Philadelphia, Pa., August 18, from carcinoma of the stomach, recurrent after an operation one year previous. He was born in Gratz, Dauphin Co., Pa., 1847.——D. F. Burner, M.D., Woodstock, Va., August 23.——J. B. Clark, M.D., Economy, Ind., August 21, aged 45 years.——J. R. Hipple, M.D., Waldo, Ohio, August 18, aged 70 years.——E. C. Putnam, M.D., Alma, Neb., August 9, aged 44 years.——Wm. H. Slevin, M.D., Toledo, Ohio, August 18, aged 30 years.——Dr. R. de B. Martins Pereira, Professor in the Lisbon School of Medicine.——Dr. Victor Mayer, Professor of Chemistry in the University of Heidelberg, author of a "Manual of Organic Chemistry" and of many important contributions to organic chemistry, aged 48.——Dr. Benjamin Clémenceau, father of the political leader of that name, aged 87. ——Dr. C. J. Ask, Professor of Surgery in the Swedish University of Lund.——Dr. Joseph Kovács, Professor of Surgery in the University of Buda-Pesth, aged 65.——Dr. Cesareo Magdalena, Assistant Professor in the Madrid Bacteriological Institute.——Dr. B. F. Sherman, Dean of the Medical Society of the State of New York, of which he was President in 1884, aged 80.——Dr. F. H. James, a notable connoisseur and collector, and one of the best authorities on numismatics in the United States, aged 72.——Dr. T. Bogomoloff, Professor of Medical Chemistry in the University of Charkoff, aged 55.—— Dr. Kremnitz, Physician to the Crown Prince of Roumania.

MISCELLANY.

A Roentgen Ray Institute in Berlin has been established under the supervision of Professor Grunmach, chiefly for diagnostic purposes.

A Scientific Latin-American Congress has been organized by the Societa Cientifica Argentina to celebrate its twenty-fifth anniversary. It will be held at Buenos Ayres, April 10 to 13, 1898, and is to be international. The medical sciences are to form an important section.

Correction.—In "The 'Schott Treatment' of Cardiac Diseases," by Dr. Camac (*vide* JOURNAL, August 28) the amount of sodium bicarbonate in bath No. 6 (p. 412) should be two pounds instead of one, which made an excess of HCl, injurious to the patient and the tub. In the discussion following the reading of the paper, the remarks of Dr. Smith of New York should be accorded to Dr. J. J. Morrissey of New York.

The Gold Harben Medal presented to Dr. v. Pettenkofer of Munich, the famous German hygienist, by the British Institute for Public Health, was first awarded in 1895, when it was presented to Sir J. Simon, at the time at the head of the English sanitary service.

Back Number Wanted.—The issue of the JOURNAL for July 3, 1897 has been entirely exhausted and in order to supply the demand for copies made by those desiring to fill their sets for binding, the JOURNAL will pay 10 cents a copy for the return of this number.

Fauvelle Prize Awarded to Prof. Ramon y Cajal of Madrid.—The Anthropologic Society of Paris has bestowed this prize of 1,200 francs in recognition of the valuable researches of Prof. Ramon y Cajal in the physiology of the nervous system. He had not contributed any special work to the society.—*Arch. de la Policlinica*, June.

New Sign of Early Tabes.—In a patient with tabes it is often possible to flex the leg at the hip without bending the knee until the toe almost touches the ear, without producing the sense of painful tension in the popliteal space so speedily felt by one in health. This is not only an interesting feature of advanced cases, but is a valuable early diagnostic sign.—*Health*, August 14.

Toxin in the Urine of Cancer Subjects.—Castelli has found in the urine of patients with cancer and cachexia a toxic element of extreme virulence. Injected into animals it produces the clinical picture of the characteristics of the blood in cancer, determining a hematolytic or inhibitory effect on the hematopoiesis.—*Archivos de la Policlinica.*

Surgery of the Stomach.—Carle and Fantini conclude from the results of eighty-four operations on the stomach, that many of the so-called neuroses of the stomach rest upon anatomic foundations, and that a simple operation to remove the cause would relieve them. They found in every case that excessive hypersecretion of hydrochloric acid ceased as soon as the obstacle that was causing stagnation was removed.—*Gaz. d. Osp. e d. Clin.*, July 1.

Sero-therapy and Surgical Tuberculosis.—D. Dasara has been very successful with Maragliano's serum supplementing surgical intervention in a case of tuberculosis of the bones and joints, described in the *Gaz. de Osp. e d. Clin.*, 34. Similarly favorable results are reported by Beccaria (in No. 78) in cases of cervical and submaxillary adenitis accompanied by keratoconjunctivitis, with tuberculous antecedents.

Wound into the Spleen.—The deep wound in the upper lateral left hypochondrium was made with a shoemaker's knife and extended into the spleen. The hemorrhage was diffuse, characteristic and alarming, but was controlled and the wound healed by first intention in a very brief time. Treatment: Antiseptic irrigation and tampon of gauze tightly packed into the wound, with compressing bandage; the incision in the skin enlarged to allow of closer packing.—*Cronica Medica*, June 15.

Hypertrophied Prostate Thirty-five Days After Double Castration.—The connective tissue was found hypertrophied to such an extent that the gland tissue was either completely atrophied or transformed into small cysts. The prostate was as large as a mandarin, hard, with a few soft spots when patient was first seen. Irrigation of the bladder was ordered for the accompanying vesical catarrh, and bilateral castration performed. The wound healed well, but the patient sank and died in thirty-five days. In such a case castration would obviously fail to relieve. —*Cbl. f. Chir.*, July 24, from *B. de la Soc. Anat. de Paris.*

Many Americans Attend.—Many members of the AMERICAN MEDICAL ASSOCIATION were present at the meeting of the British Medical Association at Montreal. Among the Americans present were the following: H. O. Marcy and F. W. Coles, Boston; Henry D. Holton, Vermont; T. D. Crothers, Conn.; W. W. Keen, J. B. Roberts and Edward Jackson, Philadelphia; S. C. Busey, F. B. Loring, Z. T. Sowers and D. Morgan, Washington, D. C.; Howard A. Kelly, Wm. Osler and R. W. Johnson, Baltimore, Md.; T.W. Miller, J. H. Hollister, E. F. Ingals, N. S. Davis, Jr., J. N. Hyde, R. D. MacArthur, W. E. Quine, A. R. Reynolds, D. A. K. Steele, F. Henrotin, John B. Hamilton, and others, Chicago; Frank P. Foster, G. F. Shrady, J. R. Goffe, R.W. Wilcox, A. R. Robinson, G. H. Fox, L. E. Holt, W. B. Noyes, A. Jacobi, F. S. Dennis, J. H. Fruitnight and S. J. Meltzer, New York City; P. S. Conner, Joseph Ransohoff and J. T. Whittaker, Cincinnati.

New German Law on Inebriety.—In the new code, the sixth paragraph, which will come into operation in Germany in 1900, enacts compulsory treatment of habitual drunkards. Among the persons liable to be interdicted, the interdiction involving being placed under a curator, who will be empowered to place the individual anywhere for treatment until discharged from curatorship by the court, inebriates are specifically mentioned. The exact description is, "he who, in consequence of inebriety, can not provide for his affairs, or brings himself or his family into the danger of need, or endangers the safety of others." This measure was first advocated in 1863, at a meeting at Hanover, presided over by Judge Naumann of Hameln.—*British Medical Journal*, August 7.

Prescription Defined.—According to the *Century* Dictionary and other recognized authorities, the word "prescription" is defined to mean "in medicine, a statement usually written of the medicine or remedies to be used by a patient and the manner of using them." So says the appellate court of Indiana in the case of Caldwell v. State, where it holds that the following writing: "B. W. Tilford, druggist, Martinsville, Ind., R. Spt. frumenti, qt. 1. For medical use. Date, Nov. 10, 1895. B. W. Tilford, M.D.," is not a prescription within the meaning of a statute prohibiting the sale of liquor on Sunday, except on a prescription therefor. It criticises the foregoing, and holds it defective as a prescription, for not being addressed to anyone, in not containing the name of the patient to whom the liquor was to be sold, nor the manner of its use. It further intimates that a prescription might be sufficient to inform the druggist of the goods desired, and in that sense, according to the United States Dispensatory, and not be sufficient to comply with the requirements of such a statute as that stated.

Censures Disclosures.—According to the record in the case of Loudoun v. Eighth Ave. Ry. Co., the appellate division of the supreme court of New York says, it would appear that there had been a disclosure by one of the medical witnesses for the defense of facts which he had obtained as the physician of the plaintiff. This, it continues, was done regularly and systemat-

ically, was a flagrant violation of the duty which he owed to his patient, and a contempt of the law which prohibits such disclosures. Under these circumstances, the court declares, the counsel was justified in calling the attention of the jury to the fact of this violation of law, of this failure of appreciation of the duties of a professional man to his patient, and of the flagrant abuse of the position which he occupied. It adds that it can not be said that any too severe language was used in criticising the conduct of a physician who would thus betray his patient. This physician had been guilty of the grossest violation of his duty, and was open to the severest criticism and condemnation.

"Sometimes" Evidence Inadmissible.—The appellate division of the supreme court of New York reversed a judgment for the plaintiff, and ordered a new trial, in the personal injury case of Blate v. Third Avenue Railroad Company, on account of a physician having been permitted to testify as to what "sometimes" happens as the consequence of a certain condition of things. It was not even an opinion of the physician as to the future condition of the plaintiff, or what would likely, or even possibly, happen to him as the result of the injury, that was elicited. But he was called to testify as to what sometimes results from such a condition as the plaintiff was found to be in, and that testimony was allowed to go to the jury under a complaint which alleged the permanency of the injury, and where the jury were instructed to allow damages for the injury that would follow from the condition in the future. This, the court holds, was error by which it was reasonably certain the jury were influenced to the disadvantage of the defendant, their verdict against the latter being quite large.

The Wire Saw.—Professor del Greco has been using L. Gigli's wire saw in his clinic for three years, and has gradually extended its use from simple resections of the ribs, until it includes all bone sections except those of the skull, and he proclaims its advantages in unqualified terms. It fits around the bones, and saws them accurately and delicately in any shape desired, never leaving a scrap unsawed, while it is yet strong enough for the hardest bones. It saws the soft parts also as evenly as a knife, and can thus be used alone for amputations, etc.; but its value is best shown in operations on the foot, which can be performed with extreme rapidity, with the foot in any desired position, and in any direction; the cut is as smooth and even as if soft parts and bones had both been cut with a knife at one stroke. It is also extremely effective in obstetric work. The inventor claims that it should take its place along with the elementary instruments, knife, scissors, needle, etc., in every surgeon's case. Bardenheuer recently mentioned its advantages in resection of the os ilei. It is made by Hartel of Breslau, on an entirely new principle, from a steel wire serrated on all sides, and can saw in any direction.—*Cbl. f. Chir.*, July 24.

Ballottement of the Bladder as a Test for Calculi.—W. M. Glagolew describes in *Wratsch* (Nos. 17 and 18), a method invented by him to assist in the diagnosis of vesical calculi, which is simple, absolutely harmless and effective, especially for children. The patient in the dorsal position, knees flexed, the physician on the right side introduces his right forefinger per rectum as far as the bladder, the volar side up and bends it rapidly several times as if beckoning with the two lower phalanges, hitting each time the floor of the bladder. If there is a non-encysted stone in the bladder it will be flung up by this motion and be felt when it falls down against the finger again. The bladder should not contain more than 150 c.c. of urine; the pelvis should be raised if more convenient; the investigation can not be continued long at a time as the sphincter ani constricts the finger and deadens the sensibility; the finger must work gently at first not to push the stone away from the median line. It should be tossed up as perpendicularly as possible to render its fall more distinct. The patient himself sometimes feels the rise and fall of the stone. There is no contra-indication to the use of this test except tendency to hemorrhage.—*St. Petersb. med. Woch.*, July 17.

A Method of Indefinitely Keeping up the Circulation of Blood in the isolated heart of a frog has been devised by Prof. C. G. Santesson of Stockholm, with which he has succeeded in keeping the heart pulsating for eight hours with a 15 centimeter inflow and an 18 outflow, pumping at each pulsation 0.25 c.c. at first and 0.2 at the close of the experiment, which could have been continued longer if desired—a total of 4.7 liters. The apparatus is extremely simple, merely two large glass cylinders (Mariotte) suspended at a certain distance above the isolated heart, which is in an air tight box partly filled with salt solution, with which they connect by a single tube with faucets, etc. The aorta tube passes out of the heart to a receptacle suspended above just below the blood cylinders, one of which is filled with normal blood while the other serves for toxicologic experimentation. Both the aorta and the vena cava tubes are connected with registering drums, and the heart box by a tube with the Ellis piston recorder. An electric device records the seconds and the four pencils write simultaneously on a Ludwig Baltzar kymographion. The *Cbl. f. Phys.*, of July 10, Vol. 9, No. 8, contains the complete illustrated description.

Physiologic Connection Between the Nerves of the Heart and the Thyroid Gland.—Prof. E. v. Cyon has resumed his important studies of the depressor nerve (horses, dogs and rabbits) and now announces: 1. That stimulation of the third root, which anastomoses with the superior cervical ganglion, diminishes the blood pressure very much by reflex action, usually accompanied by an acceleration of the cardiac impulses. He has never observed the opposite effect with this isolated stimulation, even when both vagi were intact. The pupils are frequently noticeably contracted and continue thus for a while after the irritation. 2. The root of the depressor nerve arising in the superior laryngeal nerve, serves principally to connnect the heart with the thyroid and enables it to directly control the action of the gland. The nerve fibers passing from the inferior laryngeal to the heart probably answer the same physiologic purpose. 3. Baumann's thyroiodin introduced directly into the circulation affects the nerves of the heart and the vessels, especially the depressor nerve, to a marked extent. Stimulation of the depressor after the introduction of thyroiodin causes a violent diminution of the blood pressure in many cases from which the animal is unable to rally and dies from lack of blood in the heart. He concludes his communication to the *Cbl. f. Phys.* of July 10 by stating that the anatomic and physiologic relations between the nerves of the heart and the thyroid, through the mediation of the depressor nerve, clearly explains the etiology of Basedow's disease and also of the strumous affections originating in overexertion of the heart or violent emotions.

X-Ray Photography.—J. Tarchanow has found that the body is protected from the electric effect of the Crookes' tube by placing a thin sheet of aluminum over it. It allows the passage of the X-ray, but arrests the gentle electric discharges which emanate from the Crookes' tube to quite a distance, as he has proved with frogs intoxicated with strychnin, which pass into a tetanic condition when approached to 2 or 3 cm. of the tube, if held with the nerves parallel to it. The muscles are not affected, nor the nerves, if perpendicular (*St. P. Med. Woch.*, July 17, from *Gas. Botkina*, No. 13). Foveau de Courmelles states that the more serious accidents following the use of the Crookes' tubes are caused by radiography, which requires slow vibrations, while the slighter accidents are produced by radioscopy, with which the vibrations are rapid, although the seances may be much longer and more numerous. He also asserts that a small inert Crookes' tube is acted upon by a stronger one in action, even at quite a distance. It be-

comes luminous also with stratified light. There is a series of discharges in a vacuum tube similar to the rapid discharges of condensers, which is Professor d'Arsonval's "high frequency." With this, the limits of sensibility once passed, the organism ceases to feel them, while still undergoing their curative effects. The action of the X-ray is analogous to this, and depends upon the rapidity with which it is obtained. By controlling this, we will secure a special autoconduction whose physiologic and therapeutic action can be regulated as desired. —Soc. de Biol., July 17, *Presse Méd.*, July 21.

Microbes and Thromboses in the Placenta.—Delore of Lyons has found microbes of several varieties invariably present in the placenta, and also has established the fact that the fetal side is always more or less covered with thromboses, to which he ascribes the rôle of safety filter, preventing the passage of the microbes into the fetus. His communication to the Acad. de Méd. contains observations of various cases of apparently healthy mothers with healthy infants in which streptococci were found occasionally in the placentæ, and almost always micro-, diplo- and staphylo-cocci. The microbes were found clustered in the thromboses, which he confirmed with experiments on animals. He deduces the practical conclusions that the prolonged presence of these microbes in reserve is a perpetual menace to the health of the mother, as they may at any moment determine an auto-intoxication which would be erroneously attributed to contagion. Again, in delivering the placenta it is of the utmost importance not to lacerate it, and thus free the microbes held in the thromboses.—*Bulletin*, July 20.

Lord Kelvin on Contact Electricity.—At the Royal Institution Lord Kelvin recently gave a most important lecture. He began by showing an experiment which conclusively proved Volta's theory that, when a zinc plate and a copper plate were put in contact, one became charged with positive electricity and the other with negative. Although he had shown this experiment fifty years ago at Glasgow University, says the *Builder*, yet an immense amount of ingenuity had been wasted recently in trying to explain away this phenomenon. He considered that Volta was absolutely right and made an appeal to physicists to study Volta's work seriously. A very interesting and novel experiment was shown. A plate of uranium was connected to one terminal of an electrometer, and was then touched by a plate of aluminum. It was seen by the deflection of the spot of light that the uranium plate became at first positively electrified; it then gradually lost its charge and became negatively electrified. Lord Kelvin could suggest no explanation of this very mysterious experiment. Another interesting topic touched upon was Becquerel's discovery of the radiation given off by uranium. This radiation is very feeble, but photographs of coins, etc., taken by its means were thrown on a screen. He stated that it had been conclusively proved that this radiation was not due to phosphorescence, or the slow radiation of light previously absorbed, and he could give no explanation of it. Lord Kelvin was slightly discursive, but he was listened to most eagerly, and his points were rapidly taken up by an appreciative audience.—*Scientific American.*

Honors Awarded to the Profession in France.—The town of Bresches has erected a statue to Velpeau (born there in 1795, the son of a blacksmith), who "by his works and discoveries placed France in the front rank in the world of science." The building in Paris which Pasteur occupied as a laboratory for many years has been marked with a medallion and inscription, giving the dates of his various discoveries made there. A monument has also been started for Pelletier and Caventou, "to whom we owe the discovery of quinin." Dr. Reech and Dr. Cuneo have been made Commanders of the Legion of Honor, and several others, officers. A gold medal has been presented to Dr. Recamier of Paris for his services at the Charity Bazar horror, with honorable mention of others. We note the above in one single issue of the *Progrès Médical*, evidences of the French policy of rewards for skill and devotion, found in every trade and profession, and which has developed artists out of artisans and aided materially in the progress of science.

Gastrectomy for Neoplasm of the Stomach.—At a recent meeting of the Paris Academy of Medicine, Péan (*Gaz. hebd. de Méd. et de Chir.*, July 18, 1897, page 679) reported the case of a man 56 years old who came under observation on account of a tumor of the stomach, associated with hematemesis and pronounced cachexia. Celiotomy exposed a new growth occupying the pylorus and the right half of the stomach. The neoplasm was excised between forceps placed five centimeters beyond the limits of the growth, the lower five-sixths of the wound closed with silk sutures, a Murphy button introduced into the remainder and union established with the duodenum. The abdominal wound was closed with sutures in three stages, the last uniting the omentum with the parietal peritoneum. Then the cutaneous wound was closed. The further course of the case was uncomplicated. Appetite returned and the patient gained in strength and eleven pounds in weight.

The Calot Method of Reducing Curvature of the Spine by Forcible Pressure.—M. Brun reports the death of a child of four during this operation but states that the fatality was due to the chloroform narcosis, which is extremely difficult to carry out in this operation as the litttle patient lies on his face and respiration is more or less seriously affected. Prof. C. Willems of Ghent contributes an article to the *Semaine Méd.*, of July 28 on this subject, in which he states that the narcosis is unnecessary and dangerous, and that the operation is equally if not more effective without it, while the pain is not excessive. The operation itself has upset all our preconceived notions of handing Pott's disease, and the fact that the forcible reduction of the curvature is not particularly painful is only one more astonishing feature. The child seems to object more to the forcible traction of the assistants than to the pressure on his back, crying: "Don't pull so!" rather than the scream of pain that might be expected. Willems reports eighteen cases thus treated without an anesthetic; the results were more than satisfactory in each case (ages two to four; oldest curvature five years). He recommends the operation to all, and adds that relaxation of the muscles is secured much more effectively by the fatigue of the traction than with a narcotic, as the effects of the latter are just passing away when the plaster corset is being applied, when the relaxation is most important; while without a narcotic, the muscles are at that time in the most relaxed condition from fatigue. He has seen more than one child fall asleep from fatigue the moment the tractions ceased. He concludes by observing that more assistants are required (six to eight), but that this is all and any physician can now undertake this simple reduction of the *gibbosités pottiques* alone, without other assistance than he finds in the patient's family, or any special apparatus except the Calot plaster corset, to immobilize the straightened spine.

Notes of a Gynecologist's Tour of Europe.—Asepsis is driving out antisepsis, and with it drainage. Carbolic acid has nearly disappeared. Formalin is taking the place of sublimate, and ordinary dry sterile gauze of iodoform gauze. My general impression is that the French method of extirpating the uterus or adnexa or both, per vaginam, is winning its way more and more. In regard to disinfecting the hands, Kümmell of Hamburg and Sänger of Leipsic, first scrub the hands with green soap and sand for five minutes, then with alcohol, and finally dip them in a stong solution of sublimate. Separate rooms are provided for celiotomies in Hamburg and Dresden. Müller of Berne makes his incision for celiotomy not on the median line but a centimeter to the right or left. Martin lays a common

sponge dipped in boiled oil in the abdominal cavity to prevent adhesions. Prochownick uses submucous injections of cocain and morphin instead of general narcosis, especially in sutures of the intestines, to prevent vomiting. Bumm of Basel does not drain in abdominal nor vaginal operations. Leopold uses dry gauze for draining; Aubeau a drain tube; Schauta of Vienna, iodoform gauze, and in London the old glass drainage tubes are still used. Sänger, Ohlhausen and Chrobak do not drain at all, and Pestalozzi and Jacobs only through the vagina, and not unless there is a large pus accumulation in the abdominal cavity. Catgut is used by Prochownick and the Berlin school exclusively, usually boiled in a 5 per cent. solution of carbolic acid in 80 per cent. alcohol. Silk is preferred by Kümmell; Sänger, except for buried sutures in vaginal wall; and by Freund, with silver wire for abdominal sutures. Zweifel and Leopold use dry gauze; Sänger moistens it with a sterile soda solution, Jacobs of Brussels disinfects the vagina with: 1, a saturated solution of green soap and alcohol; 2, a solution of sodium biborate and ammonium carbonate; 3, alcohol, and 4, formalin, 1 to 1500. A fatal case of iodoform intoxication in his practice has caused him to abandon iodoform gauze and use only the ordinary sterile article. Vaginofixation is very common in Berlin, even for prolapsus, and is also practiced by Rosthorn of Prague, and Schauta for retroversio. Sänger has observed seventeen normal pregnancies and deliveries in seventy cases of ventrofixation for retroversio. In Paris a modified ventrofixation is practiced; each side of the uterus is sutured with silk to the correspoding fascia and muscles. Jacobs rejects ventrofixation for retroversio. His method is to free the uterus from adhesions through the posterior vaginal wall, and Douglas's pouch, and then close the incision. The anterior wall is then incised from right to left and the peritoneum opened. The anterior wall of the uterus is then sutured with silk to the peritoneum covering the anterior vaginal wall. Normal child-bearing occurs with this operation, the uterus retaining its position. He recently found that only three out of seventy patients had survived four years after vaginal hysterectomy for carcinoma uteri. London is far behind the Continent in asepsis.—From J. Wiener's address on the "Present Status of Gynecology in Europe." *N. Y. med. Monatsschrift*, July 20.

Gleanings.—Obstinate ozena of long standing cured with antidiphtheria serum, three cases (Molinié).—Faradization effective in curing pruritus vulvæ. *Semaine Méd.*, July 14. . . Roentgen ray does not affect the Koch bacillus, but two cases of tuberculosis have been strikingly improved by treatment with it, evidently due to the direct effect of the ray on the lung tissue, similar to its known effect upon the skin. *Bul. de l'Acad. de Méd.*, July 13. . . Injections of purgative waters recommended for constipation in infants and children. One tablespoon to the year (up to 7) in a pint or half pint of tepid boiled water.—Spanish physician (Mascaro) has trained a blind man to use the bicycle, following a seeing leader, and proposes to train others to use tandems. *Gaz. Méd. de Liège*, July 15. . . Syphilis appearing in the third generation; two cases: choroiditis and keratitis. *Ann. de Derm.*, June. . . Needle broken off in wrist drawn into palm of hand and extracted by use of weak magnet alone; nine seances, twenty hours in all.—Burns promptly and radically cured with a concentrated solution of potassium permanganate applied immediately and kept on several minutes. *Progrès Méd.*, July 17. . . Serum in pneumococcus infections found to possess the agglutinative power. *Presse Méd.*, July 17. . . The University and municipality of Berlin have each erected a Roentgen laboratory. *Therap. Woch.*, July 18. . . Silk recommended for bandages for rheumatic joints.—Case of pulsating exophthalmus after fracture of basis cranii. *Deutsche med. Woch.*, July 8. . . Anteflexion of the epiglottis corroborative symptom of syphilis. *Ann. de Derm.*, June. . . Hypertrophied, painful breasts relieved and restored to normal shape by cutting out a rectangular piece of top (not wedge-shaped) and suturing to the aponeurosis of the pectoralis major. *Presse Méd.*, July 10. . . Fatal case of fluid from intra-uterine injections passing into the abdomen. Six experimental injections of colored fluids just before hysterectomy showed the fluid in the abdominal cavity in each case where the tube ends were open, and collected at the end where they were closed. *German Gyn. Congress.* . . Heidenhain begs internal therapeutists to keep track of the patients cured of intestinal occlusion by medication alone, to note relapses. *Therap. Woch.*, July 11.

Hospitals.

THE NATIONAL SANITARIUM FOR CONSUMPTIVES, the first of its kind in Canada, was opened at Gravenhurst, Ontario, August 21. There is accommodation for 100 patients, the buildings standing 500 feet above Lake Ontario, on a plot of fifty acres, sheltered by low rocky ranges on each side, and so constructed that every room will have sunlight when the sun shines.—A new wing has been added to Hamot Hospital, Erie, Pa., through a donation from the late George Selden——The Presbyterian Hospital, Milwaukee, is to be consolidated with St. Joseph's Hospital, and a new building erected for the Wisconsin College of Physicians and Surgeons on a site opposite St. Joseph's.

THE PUBLIC SERVICE.

Navy Changes. Changes in the Medical Corps of the U. S. Navy for the week ending August 28, 1897.

Asst. Surgeon W. M. Wheeler, detached from the "Marietta" and ordered to the "Wheeling" September 2.

P. A. Surgeon G. Rothganger, detached from the "Wheeling" and ordered to the "Marietta" September 2.

CHANGE OF ADDRESS.

Cutter, E. and J. A., from Mott Av. and 165th St. to 1054 Boston Road, New York, N. Y.

Dandridge, N. P., from 53 E. 4th St. to 422 Broadway, Cincinnati, Ohio.

Davidson, T. W., from Oneida to Galesburg, Ill.; Demaree, T. E., from Rossville to Claytonville, Ill.

Foreman, J. M., from Jonesburgh to 4128 Easton Av., St. Louis, Mo.; Foskett, W. A., from 394 N. Ashland Av. to 1556 Milwaukee Av., Chicago, Ill.; Frederick, R. C., from 1900 Dearborn Av. to 506 State St., Chicago, Ill.

Fuhrman, E. H., from New London to Grafton, Wis.

Gihon, A. L., from Sykesville, Md. to "Reform Club" 233 Fifth Av., New York, N. Y.; Gilbert, M. J., Willard, N. Y.

Haldenstein, J., from 32 Beaver St. to 19 Seymour Bldg., cor. 42d St. and Fifth Av., New York, N. Y.

Keir, W. F., from 309 S. Broadway to 3609 Lindell Av., St. Louis, Mo.

Lockwood, W. D., from Philadelphia, Pa., to Columbia, Mo.

Mennett, O. H., from University, Cal. to Columbus, Ind.; McBride, R. E., from Gibson City to Houma, La.; McKinnon, J. R., from 275 Ontario St. to 313 Chicago Av., Chicago, Ill.

Ross, Thos. D., from Ferndale to Mayfield, Ill.

Seeman, F. A., from Chicago, Ill., to Dubuque, Ia.

Washington, S. S. H., from Tuskeegee to Birmingham, Ala.

LETTERS RECEIVED.

Barnes, F. H., Stamford, Conn.; Barber, W. M., Birmingham, Ohio; Beauchamp, W. W., Rockford, Ohio; Bennett, Albert L., Gross Batanaga, German Kameroon, West Africa; Burns, J. F., Long Island City, N. Y.

Camac, C. N. B., Baltimore, Md.; Chiquoine, A. D., Philadelphia, Pa.; Craig, S. S., East Troy, Wis.

Davis, N. S., Jr., Chicago, Ill.; Debreu, J. A., Little Rock, Ark.

Einhorn, Max, New York, N. Y.; Ellis, T. B., Bethany, Mo.; Elliott, A. R., New York, N. Y.; Englana, J. W., Philadelphia, Pa.

Fairchild Chemical Laboratory Co., St. Louis, Mo.; Franklin, W. A., Pauline, Neb.; Fuller, Advertising Agency, C. H., Chicago, Ill.

Gœlet (2), A. H., New York, N. Y.

Harris, L. J., Pittsford, Mich.; Hill, W. B., Milwaukee, Wis.; Hot Mineral Springs, Bath, England; Hummel, A. L., Advertising Agency, New York, N. Y.

Jones, W. A., Minneapolis, Minn.; Judkins, William, Cincinnati, Ohio.

Kaszynski, Jacobus, Chicago, Ill.; Kress & Owen Company, New York, N. Y.; Kinniebrew, Tuskegee, Ala.

Larsen, L. A., Colfax, Wis.; Leach, W. W., Dundas, Minn.; LeFevre, E., New York, N. Y.; Loeb, H. W., St. Louis, Mo.

Marks, A. A., New York, N. Y.; Mattison (2), J. B., Brooklyn, N. Y.; Madison, J. B., Brooklyn, N. Y.; Manley, Thos. H., Berlin, Germany; Medical Echo Publishing Co., Lynn, Mass.; Merrick, (2) M. B., Passaic, N. J.; Minor, J. C. Hot Springs, Ark.; Mulford H. K. Company, Philadelphia, Pa.

Nixon, J. W., Soldier, Kan.; Norwich Pharmacal Co., Norwich, N. Y.

Ohlmacher, A. P., Gallipolis, Ohio.

Pabst Brewing Co., Milwaukee, Wis.; Pantaraph Printing & Stationary Co., Bloomington, Ill.; Paquin, Paul, St. Louis, Mo.; Paquin Laboratories, Paul, St. Louis, Mo.; Postum Cereal Co., Ltd, Battle Creek, Mich.; Platt, H. B., New York, N. Y.; Purin, M. G., New York, N. Y.

Reed, W. W., Fowler, Colo.; Reik, H. O., Baltimore, Md.; Rio Chemical Co., St. Louis, Mo.

Sayre, R. H., New York, N. Y.; Stearns, F. & Co., Detroit, Mich.; Stockley, Darwin R., Evanston, Ill.; Sundberg, John C., Canton Thurgau, Switzerland.

Walling, P. A., Park Rapids, Minn.; Wampole, H. K. & Co., Philadelphia, Pa.; Ward & Co., Montgomery, Chicago, Ill.; Warner, W. R. & Co., Philadelphia, Pa.; Waters, Geo. M., Columbus, Ohio; Watkins, T. J., Chicago, Ill.; Wood, F. B., Garrett, Ind.